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VAN. H. MANNING, DIRECTOR

METAL-MINE ACCIDENTS

IN THE

UNITED STATES

DURING THE CALENDAR YEAR 1917

(With supplemental labor and accident tables for the years 1911 to 1917, inclusive)

COMPILED BY

ALBERT H. FAY

WASHINGTON

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METAL-MINE ACCIDENTS DURING THE CALENDAR YEAR 1917.

Compiled by ALBERT H. FAY.

INTRODUCTION.

Returns received by the Bureau of Mines from the operators of metal mines for the year 1917 are extremely gratifying for two reasons—the normal fatality rate has not increased, and the nonfatal injuries show a decrease in spite of war conditions and labor shortage. The labor shortage, however, is more apparent than real, and is perhaps largely caused by increased turnover and shifting of labor from one occupation to another. The report for the year 1917 includes returns from 4,637 operators, as compared with 5,258 for the year 1916, being about 600 less than the number reporting for 1916. The number of days' work done during 1917 was only 110,000 less than in the previous year. Compared with 1916 returns, the number of employees in the different groups of mines is as follows: Copper mines, lead and zinc mines (Mississippi Valley), and the nonmetal mines employed practically the same number as in 1916; iron mines show an increase of about 4,000; and the gold and silver group shows a decrease of 8,200. The total number of men reported employed in 1917 was 200,579, as compared with 204,685 in 1916. In addition, the metallurgical works, not including iron and steel, reported 84,042 men in 1917, as compared with 80,201 in 1916.

There were 852 fatalities reported in 1917. This number is abnormal, on account of the fire in the North Butte mine, Butte, Mont., on June 8, 1917, in which 161 men were killed. The fatality rate for 1917 is, therefore, 4.44 per 1,000 300-day workers, as compared with 3.62 per 1,000 for 1916. This rate, however, is not a true index for the industry, by reason of the disaster mentioned. Excluding the 161 fatalities from the mine fire, the normal rate for 1917 would be 3.60 per 1,000, as compared with 3.62 for 1916, this being the lowest recorded since the bureau began the collection of accident statistics at metal mines in 1911, when the rate was 4.45 per 1,000 300-day workers.

The number of nonfatal injuries was 46,286, as compared with 48,237 in 1916, making a nonfatal accident rate of 240.87 per 1,000 300-day workers, as compared with 250.64 per 1,000 in 1916 and 248.56 in 1915. The general tendency of the nonfatal injury rates

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from 1911 to 1916 has been to increase, not so much because of the increasing hazard of the industry as on account of the enactment of compensation laws, and the establishment of better inspection service, which have caused the mining companies to keep more complete records that reveal the real hazard of the industry. It is believed that the foregoing nonfatal injury rates at metal mines are lower than those that actually exist. This statement is borne out by the data compiled in Table 20 (p. 52), which shows details covering a period of four years compiled from the reports of representative companies at whose mines systematic records are being kept and a large amount of safety work is being done. The average nonfatal injury rate for the four years is 350 per 1,000 300-day workers.

SCOPE OF STATISTICS.

In the compilation of the figures given in the following tables, which are derived from reports received from operators, the size of the mines was not considered, consequently the figures cover reports from prospectors, development companies, and producing mines. Although the Bureau of Mines is authorized to collect data on accidents at mines, there is no Federal law compelling operators to render such reports. However, the majority of the operators promptly and cheerfully replied to the bureau's requests for information. The tabulated statistics represent 4,637 operators who actually worked their mines during the year. As far as can be ascertained, all of the large companies made out detailed reports, so that, measured on the basis of production, the statistics are representative of the industry.

The tables in the following pages are arranged so as to represent five divisions of the mining industry, as follows:

Copper mines.—All of the copper mines and prospects that were reported in operation in the various copper-producing States are included in this group. The list represents 649 operators. (Tables 6, 7, 16, 17, and 18.)

Gold, silver, and miscellaneous metal mines.—This group comprises the gold mines, both lode and placer, silver mines, lead-silver mines, gold-silver mines, the lead and zinc mines other than those in the Mississippi Valley, and the mines working ores of quicksilver, manganese, tungsten, vanadium, chromium, etc. Also, pyrite mines are included, as the cinder is used in some metallurgical works for its iron and copper content, and bauxite mines, because bauxite is the principal source of metallic aluminum. This group represents 3,166 operators, who reported their mines as active part or all of the year. (Tables 8, 9, 16, 17, and 18.)

Iron mines.—All of the important iron mines, representing 205 operators, are included in this group. (Tables 10, 11, 16, 17, and 18.)

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Lead and zinc mines (Mississippi Valley).—The lead and zinc mines of the Mississippi Valley, represented by reports of 369 operators, are grouped together as representing an industry in which general conditions are similar. (Tables 12, 13, 16, 17, and 18.)

Nonmetallic mineral mines.—The nonmetallic mineral mines, representing 248 operators, include those for asbestos, asphaltum, barite, feldspar, garnet, graphite, gypsum, kaolin, mica, phosphate rock, quartz, talc, salt, and soapstone. Coal mines are not included. (Tables 14, 15, 16, 17, and 18.)

ACKNOWLEDGMENTS.

The Bureau of Mines gratefully acknowledges the assistance of the State mine inspectors and other officials of the various State mining departments, who have verified and corrected from their records, often by expending considerable labor, the data reported to the bureau by the operators. Special mention should be made of the assistance rendered by the mine inspectors of Alaska, Arizona, Colorado, Idaho, and South Dakota, and the Industrial Accident Commission of California. To both the operators and the State mining officials the Bureau of Mines extends its thanks for their hearty cooperation. The author acknowledges the assistance rendered by W. W. Adams and Miss Mary Bringhurst.

PUBLICATION OF ACCIDENT STATISTICS.

In publishing these statistics the Federal Bureau of Mines has no intent of encroaching on the field covered by the annual or biennial reports of State mine inspectors or mining departments. The bureau hopes, however, that the distribution of this information will help to establish a uniform basis for recording and reporting mine accidents, the number of men employed, and the number of days' work performed. When all mine-accident statistics are thus placed on the same basis, the making of comparisons and the drawing of conclusions will be rendered much easier.

As bearing on the difficulties that attend the compilation of comparable figures, attention is called to these facts. A number of States have no inspectors for metal mines. There is a lack of uniformity in the reports issued by the various States, as the fiscal years are not the same. The mines subject to inspection differ; in some States all mines are included, whereas in others only those mines employing 5, 10, or 20 men underground are included. Compensation laws in most States apply to all mines, but in some they are elective at the option of the operator. Although the total number of deaths reported in the various States agrees closely with the inspectors' reports, there is some variation as to the classification.

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The Bureau of Mines will be glad to receive suggestions from State inspectors, and from any person interested in mining, as to the form in which accident statistics can be presented most effectively and their publication made most useful to the mining industry.

CLASSIFICATION OF INJURIES.

As many of the States now have compensation laws, the bureau's classification of serious and slight injuries is on a 14-day (2-week) basis in order to conform to the classification used by the States. This classification of injuries includes three types, as follows:

Fatal, serious, and slight injuries, 1916 and 1917.

Injury.	1916	1917
1. Fatal	697	852
2. Serious (time lost more than 14 days).		
A. Permanent disability—		
Total [a]	44	39
Partial [b]	693	666
B. Others	10,099	10,220
3. Slight (time lost, 1 to 14 days, inclusive)	37,401	35,361
Total nonfatal injuries	48,237	46,286

[a] Permanent total disability: Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[b] Permanent partial disability: Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

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TABLE 1.—*ALL MINES: Men employed, and number killed and injured, by kinds of mines, during the years ended Dec. 31, 1917 and 1916.*

1917.

Kind of mine.	Active operators.	Men employed.			Average days active.	Days of labor performed.	Number killed.			Number injured. (Time lost, more than 1 day).			Widows.	Orphans.
		Underground.	On the surface.	Total.			Underground.	On the surface.	Total underground and surface.	Underground.	On the surface.	Total underground and surface.		
Copper	649	43,715	17,560	61,275	312	19,085,563	[a]352	22	374	16,532	3,403	19,935	142	336
Gold, silver and miscellaneous metal	3,166	35,812	16,080	51,892	281	14,581,811	166	30	196	7,144	1,241	8,385	41	60
Iron	205	31,549	25,681	57,230	283	16,188,051	135	56	191	8,872	3,406	12,278	85	190
Lead and zinc (Mississippi Valley)	369	15,075	5,194	20,269	246	4,993,390	65	3	68	3,777	767	4,544	42	78
Nonmetallic mineral	248	2,726	7,187	9,913	280	2,776,996	9	14	23	430	714	1,144	15	28
Total, 1917	**4,637**	**128,877**	**71,702**	**200,579**	**287**	**57,625,811**	**727**	**125**	**852**	**36,755**	**9,531**	**46,286**	**325**	**692**

1916.

Copper	604	43,215	18,013	61,228	309	18,932,142	188	42	230	16,643	3,525	20,168	84	157
Gold, silver and miscellaneous metal	3,921	42,158	17,949	60,107	268	16,091,742	190	27	217	8,325	1,909	10,234	71	116
Iron	199	30,485	23,003	53,488	278	14,869,127	133	36	169	9,246	2,658	11,904	88	222
Lead and zinc (Mississippi Valley)	285	14,687	5,928	20,615	264	5,442,578	52	5	57	3,844	929	4,773	31	61
Nonmetallic mineral	249	2,618	6,629	9,247	260	2,400,836	11	13	24	391	767	1,158	11	18
Total, 1916	**5,258**	**133,163**	**71,522**	**204,685**	**282**	**57,736,425**	**574**	**123**	**697**	**38,449**	**9,788**	**48,237**	**285**	**574**

[a] Includes 161 fatalities due to the North Butte mine fire, Butte, Mont.

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TABLE 2.—*ALL MINES: Fatalities and injuries per 1,000 300-day workers, employed during the years ended Dec. 31, 1911 to 1917.*

Kind of mine.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
1917.									
Copper	46,016	17,603	63,619	7.65	1.25	[a] 5.88	359.27	193.32	313.35
Gold, silver, and miscellaneous metal	34,473	14,133	48,606	4.82	2.12	4.03	207.23	87.81	172.51
Iron	31,032	22,928	53,960	4.35	2.44	3.54	285.90	148.55	227.54
Lead and zinc (Mississippi Valley)	12,444	4,200	16,644	5.22	.71	4.09	303.50	182.62	272.99
Nonmetallic mineral	2,850	6,406	9,256	3.16	2.19	2.48	150.82	111.46	123.58
Total, 1917	**126,815**	**65,270**	**192,085**	**5.73**	**1.92**	**4.44**	**289.83**	**146.02**	**240.97**
1916.									
Copper	44,541	18,566	63,107	4.22	2.26	3.64	373.66	189.86	319.58
Gold, silver, and miscellaneous metal	37,621	16,018	53,639	5.05	1.69	4.05	221.29	119.18	190.79
Iron	28,248	21,316	49,564	4.71	1.69	3.41	327.32	124.70	240.17
Lead and zinc (Mississippi Valley)	12,925	5,217	18,142	4.02	.96	3.14	297.41	178.07	263.09
Nonmetallic mineral	2,266	5,737	8,003	4.85	2.27	3.00	172.55	133.69	144.70
Total, 1916	125,601	66,854	192,455	4.57	1.84	3.62	306.12	146.41	250.64
Total, 1915	89,821	52,176	141,997	5.02	1.95	3.89	319.85	125.84	248.56
Total, 1914	91,659	50,960	142,619	5.08	1.82	3.92	261.81	122.04	211.87
Total, 1913	121,293	62,300	183,593	4.52	2.17	3.72	210.44	119.52	179.59
Total, 1912	105,153	56,509	161,662	4.96	2.46	4.09	236.42	103.95	190.11
Total, 1911	98,389	57,700	156,089	5.51	2.65	4.45	217.28	90.10	170.27

[a] Excluding the deaths from the North Butte mine fire, the fatality rate was 3.34 per 1,000, the lowest on record for the copper group. The total for the United States was 3.60 per 1,000, the lowest on record.

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TABLE 3.—*ALL MINES: Men employed, number killed, and days worked, by States, during the year ended Dec. 31, 1917.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	On the surface.	Total.	Underground.	On the surface.	Total.		Underground.[a]	On the surface.	Total.		
Alabama	42	5,745	3,343	9,088	1,740,465	798,882	2,539,347	279	28	4	32	11	16
Alaska	362	4,800	2,776	7,576	1,051,573	618,602	1,670,175	220	21	9	30	7	4
Arizona	450	16,204	6,288	22,492	4,916,820	1,822,247	6,739,067	300	76	4	80	38	91
Arkansas	38	325	1,248	1,573	63,251	344,579	407,830	259	.....	.....	.....	.....	.....
California	628	6,100	4,023	10,123	2,061,304	1,355,797	3,417,101	338	37	7	44	.....	.....
Colorado	407	6,793	756	7,549	2,038,111	226,772	2,264,883	300	44	3	47	.....	.....
Connecticut	3	59	56	115	17,936	16,520	34,456	300	.....	.....	.....	.....	.....
Florida	15	50	2,451	2,501	15,000	722,887	737,887	295	.....	7	7	4	11
Georgia	29	311	604	915	90,696	150,670	241,366	264	2	2	4	2	2
Idaho	414	4,328	1,802	6,130	1,247,129	415,142	1,662,271	271	19	5	24	9	16
Illinois	11	420	257	677	112,598	69,791	182,389	269	3	.....	3	3	5
Iowa	8	252	43	295	63,923	9,381	73,304	248	.....	.....	.....	.....	.....
Kansas	28	613	288	901	142,059	64,791	206,850	230	3	1	4	3	8
Kentucky	25	303	402	705	68,514	74,887	143,401	203	.....	.....	.....	.....	.....
Maine	5	35	78	113	12,775	20,675	33,450	296	.....	.....	.....	.....	.....
Maryland	12	30	99	129	7,976	27,436	35,412	275	.....	.....	.....	.....	.....
Massachusetts	3	39	12	51	11,807	2,996	14,803	290	.....	.....	.....	.....	.....
Michigan	86	21,854	10,669	32,523	6,611,401	2,999,556	9,610,957	296	97	12	109	59	156
Minnesota	66	9,489	12,331	21,820	2,739,368	3,472,544	6,211,912	285	31	32	63	22	40
Missouri	210	9,367	2,639	12,006	2,376,080	656,124	3,032,204	253	34	2	36	21	45
Montana	284	14,420	1,844	16,264	4,360,603	504,964	4,865,567	299	210	4	[b]214	72	155
Nevada	405	4,530	2,325	6,855	1,372,849	686,205	2,059,054	300	23	8	31	10	12
New Hampshire	6	25	56	81	7,500	13,705	21,205	262	.....	.....	.....	.....	.....
New Jersey	6	1,456	736	2,192	436,767	182,873	619,640	283	7	2	9	6	8
New Mexico	135	2,419	2,555	4,974	979,669	512,114	1,491,783	300	9	4	13	2	7
New York	33	2,554	1,351	3,905	879,346	377,255	1,256,601	322	12	1	13	9	19
North Carolina	23	253	714	967	69,947	137,989	207,936	215	1	.....	1	.....	.....
Ohio	4	215	6	221	38,540	1,500	40,040	181	.....	.....	.....	.....	.....
Oklahoma	42	2,179	715	2,894	466,235	164,269	630,504	218	18	.....	18	11	13
Oregon	183	643	543	1,186	152,452	92,586	245,038	207	1	.....	1	1	.....
Pennsylvania	19	40	474	514	11,340	125,250	136,590	266	.....	.....	.....	.....	.....
South Carolina	3	60	173	233	18,000	32,400	50,400	216	.....	.....	.....	.....	.....
South Dakota	64	1,338	822	2,160	441,585	266,779	708,364	328	7	.....	7	3	7
Tennessee	32	1,591	1,944	3,535	470,841	490,307	961,148	272	8	3	11	7	21
Texas	12	369	249	618	121,620	68,875	190,495	308	.....	.....	.....	.....	.....
Utah	233	5,079	2,854	7,933	1,626,780	959,256	2,586,036	326	22	4	26	12	28
Vermont	7	98	55	153	26,784	11,703	38,487	252	.....	.....	.....	.....	.....
Virginia	36	990	1,680	2,670	280,380	438,000	718,380	269	4	4	8	5	8

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Washington	168	647	451	1,098	131,999	91,422	223,421	203	1	3	4	2	.....
Wisconsin	53	2,646	1,143	3,789	713,953	286,708	1,000,661	264	9	3	12	6	20
Wyoming	42	180	346	526	40,999	89,771	130,770	249	.....	1	1	.....	.....
Other States	5	28	501	529	7,630	176,996	184,626	349	.....	.....	.....	.....	.....
Total, 1917	**4,637**	**128,877**	**71,702**	**200,579**	**38,044,605**	**19,581,206**	**57,625,811**	**287**	**727**	**125**	**852**	**325**	**692**
Total, 1916	5,258	133,163	71,522	**204,685**	37,680,628	20,055,797	57,736,425	282	574	123	**697**	285	574
Total, 1915	4,322	96,223	55,895	**152,118**	26,946,220	15,652,795	42,599,015	280	451	102	**553**	275	484
Total, 1914	4,805	101,618	56,497	**158,115**	27,497,780	15,288,060	42,785,840	271	466	93	**559**	252	442
Total, 1913	6,387	126,369	64,907	**191,276**	36,387,908	18,689,947	55,077,855	288	548	135	**683**	286	501
Total, 1912	5,967	110,056	59,143	**169,199**	31,546,002	16,952,508	48,498,510	287	522	139	**661**	273	520
Total, 1911	5,232	104,623	61,356	**165,979**	29,516,604	17,309,969	46,826,573	282	542	153	**695**	297	600

a All data in this and other tables for 1917 supplied by the Industrial Accidents Commission of California. In addition, the commission reports 667 mines as idle, 305 out of business, and 228 mine prospects upon which but little labor was performed.

b All data in this and other tables for 1917 supplied by Fred Carroll, commissioner, State Bureau of Mines, Colorado.

c Includes 161 men killed by mine fire in the Speculator mine, Butte, Mont., June 8, 1917.

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TABLE 4.—*ALL MINES: Fatalities, by causes*

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alabama	22			2	2					
Alaska	7	1		3		3	2			
Arizona	32	1		9	8	10	1		2	
Arkansas										
California	11			10		1			1	1
Colorado	13	1	1	3	2	7	1			
Connecticut										
Florida										
Georgia				1	1					
Idaho	7			1		4			1	1
Illinois	1			1						
Iowa										
Kansas										
Kentucky										
Maine										
Maryland										
Massachusetts										
Michigan	34	4		4	6	8	2		1	1
Minnesota	14				5	2				
Missouri	14	3		7	3	1				
Montana	19	1	1	8	1	4	1			
Nevada	5	1		2	3	1			2	
New Hampshire										
New Jersey	1				1			1	1	
New Mexico				2		2			2	
New York	4	2			4	1		1		
North Carolina										
Ohio										
Oklahoma	5			3		1			1	
Oregon										
Pennsylvania										
South Carolina										
South Dakota	2			2		2				
Tennessee	3	1		3						
Texas										
Utah	8			7		5				
Vermont										
Virginia						1				
Washington	1									
Wisconsin	3			1		3				
Wyoming										
Other States										
Total, 1917	**206**	**15**	**2**	**69**	**36**	**56**	**7**	**2**	**11**	**3**
Total, 1916	217	10	2	74	33	40	11		17	2
Total, 1915	191	10	7	72	18	45	10	1	10	
Total, 1914	185	7	3	49	31	48	5	3	8	1
Total, 1913	220	10	8	77	35	52	10		16	4
Total, 1912	212	2	6	73	35	43	10	2	19	2
Total, 1911	191		10	62	20	47	14		15	10

[a] See footnote c, Table 3.

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and States, during the year ended Dec. 31, 1917.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush or water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
					26					2		2
				1	17		1			3		4
	1			3	67	5	1		1		2	9
		1		3	28	2	3			4		9
		1		1	30	3	5	2		3	1	14
					2							
1				3	18					1		1
					2	1						1
						1		1		1		3
	3	2		5	70	11	3	1		9	3	27
					21	6				3	1	10
				1	29	3	1				1	5
a 164				2	201	1	4			4		9
				1	15	3				4	1	8
					4				2	1		3
					6		1			2		3
					12							
						1						1
	2			1	13	2	2				1	5
						1						1
					6					1		1
					7						1	1
				1	21					1		1
				1	2					1	1	2
					1							
					7	1				1		2
165	6	4		23	605	41	21	4	3	41	12	122
27	6	1	2	23	465	45	18	2	2	33	9	109
	3	3	1	3	374	34	13	2	1	20	7	77
10	1	8		7	366	34	10	2		43	11	100
	3			23	458	26	15	2	3	34	10	90
1	4	5		8	422	40	12	2		37	9	100
37	8	12		10	436	57	18	4			27	106

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TABLE 4.—*ALL MINES: Fatalities, by causes*

State.	Surface									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Alabama	1									1
Alaska				1			1		5	7
Arizona	2	1							1	4
Arkansas										
California		1		4					1	6
Colorado									2	2
Connecticut										
Florida							1	1	1	3
Georgia										
Idaho				1					3	4
Illinois										
Iowa										
Kansas		1								1
Kentucky										
Maine										
Maryland										
Massachusetts										
Michigan	1	1		1				1	5	9
Minnesota	2			1					4	7
Missouri				1						1
Montana	1						2	1		4
Nevada							1	2		3
New Hampshire										
New Jersey									2	2
New Mexico										
New York								1		1
North Carolina										
Ohio										
Oklahoma										
Oregon										
Pennsylvania										
South Carolina										
South Dakota										
Tennessee		1		1						2
Texas										
Utah										
Vermont										
Virginia		2							1	3
Washington				3						3
Wisconsin							1		1	2
Wyoming										
Other States										
Total, 1917	7	7		13			6	6	26	65
Total, 1916	9	5	2	15	1	1	7	12	24	76
Total, 1915	4	7	2	3			1	6	25	48
Total, 1914	3	7	5	4			6	4	8	37
Total, 1913	9	4	2	5	1		5	11	12	49
Total, 1912	6	5	2	6			5	11	24	59
Total, 1911	4	8	3				2	8	42	67

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and States, during the year ended Dec. 31, 1917—Continued.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		
1	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	3	32
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	30
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	44
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	47
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	1	.....	.....	.....	.....	.....	1	.....	2	4	7
1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2	4
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	24
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	2	.....	.....	.....	.....	1	.....	.....	.....	3	109
8	6	9	2	.....	.....	.....	.....	.....	.....	.....	25	63
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	36
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	214
1	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	5	31
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
2	.....	1	.....	1	.....	.....	.....	.....	.....	.....	4	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	3	.....	.....	.....	.....	.....	.....	.....	.....	4	26
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	12
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
17	10	23	2	2	.....	.....	1	2	.....	3	60	852
8	15	13	1	2	1	.....	1	2	.....	4	47	697
12	6	19	1	6	1	.....	2	3	.....	4	54	553
18	11	9	1	4	1	.....	5	3	.....	4	56	559
17	12	30	2	1	1	.....	10	5	.....	8	86	683
16	21	20	4	3	2	.....	6	1	.....	7	80	661
35	16	21	1	3	1	.....	3	.....	.....	6	86	695

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TABLE 5.—*ALL MINES: Injuries, by causes*

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alabama	213	433	189	14	572	50	44	117	2	12
Alaska	51	45	12	7	28	13	15	28	.....	7
Arizona	1,813	692	727	103	965	193	70	324	13	34
Arkansas	3	2	.....	1	1	.....	1	1	.....	.....
California	111	33	265	37	6	44	.....	146	9	182
Colorado	184	75	42	20	149	90	5	55	5	12
Connecticut	8	.....	2	.....	.....	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	4	4	8	.....	18	.....	.....	.....	.....	.....
Idaho	177	92	127	11	91	29	3	72	4	6
Illinois	25	21	1	7	21	1	1	7	.....	.....
Iowa	2	14	1	.....	2	.....	.....	3	.....	1
Kansas	10	9	2	.....	4	.....	1	4	.....	1
Kentucky	1	12	.....	.....	4	.....	.....	2	.....	2
Maine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan	1,929	1,513	777	69	996	139	211	395	24	49
Minnesota	736	164	513	37	370	65	32	60	6	4
Missouri	255	461	27	31	293	67	15	269	3	6
Montana	966	391	510	41	538	137	27	131	1	24
Nevada	242	68	85	14	71	42	4	75	5	19
New Hampshire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	38	90	20	10	25	23	7	25	.....	1
New Mexico	320	47	50	15	30	7	6	18	1	6
New York	51	344	25	5	120	13	12	100	3	7
North Carolina	.....	21	1	1	25	.....	.....	.....	.....	3
Ohio	3	12	.....	2	5	.....	.....	5	.....	.....
Oklahoma	90	100	13	3	21	11	4	31	.....	.....
Oregon	16	12	6	.....	6	5	5	7	.....	.....
Pennsylvania	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	80	210	18	6	92	9	15	65	2	7
Tennessee	57	124	39	17	48	6	3	36	2	2
Texas	13	10	.....	3	.....	1	.....	2	.....	1
Utah	440	102	97	28	167	68	18	67	3	7
Vermont	7	15	1	.....	4	2	1	1	1	.....
Virginia	38	24	22	9	30	4	2	3	.....	1
Washington	18	1	.....	1	.....	30	68	33	.....	13
Wisconsin	131	191	38	7	122	25	20	65	1	11
Wyoming	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Other States	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1917	**8,032**	**5,333**	**3,618**	**499**	**4,825**	**1,074**	**590**	**2,147**	**85**	**418**

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and States, during the year ended Dec. 31, 1917.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
.....	.....	.....	18	162	1,826	.....	1	1	.....	21	3	26
.....	.....	.....	18	52	276	.....	4	.....	.....	6	3	13
1	17	2	167	1,580	6,701	5	13	3	.....	21	57	99
.....	.....	.....	.....	1	10	.....	1	.....	.....	.....	.....	1
2	16	2	90	1,719	2,662	11	1	7	1	23	81	124
.....	.....	.....	18	180	835	3	9	.....	.....	28	4	44
.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	3	37	.....	.....	.....	.....	1	.....	1
1	.....	.....	44	241	898	1	10	.....	.....	11	5	27
.....	.....	.....	.....	32	116	.....	.....	.....	.....	3	2	5
.....	.....	.....	.....	20	43	.....	.....	.....	.....	.....	.....	.....
.....	3	.....	.....	18	52	1	6	.....	.....	8	1	16
.....	.....	.....	.....	.....	21	2	2	.....	.....	1	1	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	8	.....	91	958	7,159	17	61	3	2	71	83	237
3	1	.....	65	384	2,440	5	14	.....	1	22	31	73
.....	3	.....	88	370	1,888	8	51	.....	.....	34	39	132
34	4	.....	59	541	3,404	1	83	.....	.....	32	24	140
.....	2	.....	31	206	864	6	2	.....	.....	13	17	38
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	6	53	298	5	6	.....	1	6	16	34
4	6	.....	3	59	572	5	8	.....	.....	5	3	21
.....	.....	.....	15	188	883	1	9	.....	.....	.....	10	20
.....	.....	.....	16	.....	67	2	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	8	35	.....	.....	.....	.....	.....	.....	.....
.....	3	.....	11	320	607	2	147	1	2	21	12	185
.....	.....	.....	3	26	86	.....	1	.....	.....	1	2	4
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	2	132	638	.....	.....	.....	.....	3	11	14
.....	.....	.....	8	47	389	2	3	.....	.....	6	7	18
.....	.....	.....	1	22	53	.....	2	.....	.....	2	.....	4
.....	.....	.....	37	269	1,303	4	6	1	.....	16	10	37
.....	.....	.....	1	7	40	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	2	13	148	.....	.....	.....	1	2	1	4
.....	.....	.....	.....	65	229	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	20	154	786	4	10	1	.....	17	12	44
.....	.....	.....	.....	8	9	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
45	64	4	814	7,838	35,386	85	450	17	8	374	435	1,369

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TABLE 5.—***ALL MINES:*** *Injuries, by causes*

State	Surface (shops and yards).									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Alabama	22	12	6	19	12	30	.....	24	96	**221**
Alaska	8	1	8	12	31	31	2	6	83	**182**
Arizona	67	36	6	54	43	87	6	67	441	**807**
Arkansas	.....	.....	1	.....	.....	1	.....	.....	1	**3**
California	4	10	1	3	2	12	.....	1	62	**95**
Colorado	30	3	2	34	5	9	5	35	59	**182**
Connecticut	.....	.....	.....	1	.....	.....	.....	.....	1	**2**
Florida	.....	18	.....	18	19	20	4	22	79	**180**
Georgia	5	1	.....	.....	.....	5	.....	1	1	**13**
Idaho	4	.....	1	8	6	8	1	7	75	**110**
Illinois	1	.....	.....	5	3	2	.....	2	17	**30**
Iowa	.....	.....	.....	2	.....	.....	.....	.....	21	**23**
Kansas	1	.....	.....	1	.....	2	.....	2	6	**12**
Kentucky	.....	.....	.....	.....	.....	2	.....	4	1	**7**
Maine	.....	.....	.....	.....	.....	.....	.....	.....	1	**1**
Maryland	.....	.....	.....	1	.....	.....	.....	.....	.....	**1**
Massachusetts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan	26	14	34	142	64	142	6	65	543	**1,036**
Minnesota	53	31	10	68	40	105	10	70	352	**739**
Missouri	10	16	5	19	30	33	4	71	143	**331**
Montana	34	4	7	66	24	135	7	31	109	**417**
Nevada	17	6	.....	10	9	10	.....	8	24	**84**
New Hampshire	.....	.....	.....	1	.....	1	.....	1	.....	**3**
New Jersey	3	3	1	3	2	3	.....	3	24	**42**
New Mexico	33	2	.....	21	6	24	.....	7	29	**122**
New York	4	7	2	9	10	13	1	10	53	**109**
North Carolina	13	1	.....	2	8	8	.....	.....	1	**33**
Ohio	.....	.....	.....	.....	.....	.....	.....	.....	4	**4**
Oklahoma	4	.....	10	15	18	12	.....	21	50	**130**
Oregon	1	.....	.....	3	3	.....	2	7	5	**21**
Pennsylvania	.....	1	1	.....	2	3	.....	.....	10	**17**
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	4	2	1	4	1	11	.....	8	42	**73**
Tennessee	17	28	5	10	20	22	.....	16	48	**166**
Texas	1	.....	.....	3	1	.....	.....	2	10	**17**
Utah	16	11	12	24	9	20	4	40	211	**347**
Vermont	.....	.....	.....	1	2	1	.....	.....	5	**9**
Virginia	11	12	2	6	4	16	.....	8	20	**79**
Washington	.....	.....	.....	5	2	15	.....	7	13	**42**
Wisconsin	7	3	6	9	26	25	3	22	78	**179**
Wyoming	.....	.....	.....	.....	1	.....	.....	.....	1	**2**
Other States	15	1	2	14	17	11	.....	9	65	**134**
Total, 1917	**411**	**223**	**123**	**593**	**420**	**819**	**55**	**577**	**2,784**	**6,005**

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and States, during the year ended Dec. 31, 1917.—Continued.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		1917
1	12	27	13	10	2	12	19	1	24	53	174	2,247
11	1	.....	.....	3	.....	.....	1	.....	3	53	72	543
36	2	11	4	14	.....	.....	3	1	29	153	253	7,860
19	6	17	.....	.....	.....	1	.....	.....	9	9	61	75
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	6	7	2,888
.....	.....	.....	.....	1	.....	.....	4	1	2	5	13	1,074
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	13
8	13	5	1	8	.....	.....	5	1	7	34	82	262
2	1	1	8	2	.....	.....	1	.....	.....	.....	15	66
.....	1	1	.....	.....	.....	.....	1	.....	.....	6	9	1,044
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	151
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	67
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	81
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	7	41
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
33	.....	19	19	18	.....	.....	.....	.....	18	86	193	8,625
134	47	213	193	102	1	3	16	.....	166	346	1,221	4,473
3	.....	17	.....	.....	.....	.....	.....	.....	3	10	33	2,384
8	.....	1	.....	1	.....	.....	3	.....	1	3	17	3,978
25	1	8	5	19	1	.....	11	.....	10	58	138	1,124
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	4
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	3	377
33	3	68	32	29	3	4	11	.....	21	77	281	996
9	1	1	1	5	.....	.....	4	.....	.....	10	31	1,043
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	3	4	106
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	923
1	2	.....	.....	.....	.....	.....	.....	.....	4	5	12	123
12	.....	3	4	9	.....	.....	1	.....	5	22	56	74
1	.....	2	.....	1	.....	1	1	.....	.....	2	8	8
1	1	1	.....	1	.....	1	.....	.....	.....	.....	5	730
16	2	4	3	.....	.....	.....	13	.....	2	14	54	627
1	.....	2	.....	.....	.....	1	.....	.....	1	4	9	83
211	18	35	26	85	4	.....	12	.....	29	278	698	2,385
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49
6	5	5	.....	2	.....	1	1	.....	4	7	31	262
1	2	.....	.....	.....	.....	.....	.....	.....	.....	6	9	280
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	22	1,031
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	12
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	135
579	118	443	309	311	11	24	108	4	339	1,280	3,526	46,286

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ACCIDENT STATISTICS BY GROUPS OF MINES.

COPPER MINES.

The figures for copper mines in Tables 6 and 7 are compiled from reports of 649 operators that employed 61,275 men, of whom 43,715 worked underground and 17,560 on the surface, not including employees at copper metallurgical works.

The total number of deaths and injuries from accidents and the rates per 1,000 300-day workers, are as follows: Deaths, 374 or 5.88 per 1,000, as compared with 3.64 for 1916; injuries, 19,935 (Table 18), or 313.35 per 1,000, as compared with 319.58 for 1916. Of the total number of fatalities, 352 were underground and 22 on the surface. The 1917 rate was augmented abnormally by the disastrous fire at the North Butte mine, Butte, Mont., June 8, 1917, in which 161 men lost their lives. Excluding this disaster, the fatality rate for copper mines was 3.34, the lowest on record, having decreased from 5.18 in 1911.

The seemingly high rates of nonfatal injuries for this group of mines are not due so much to greater hazards in copper mines as to the fact that accurate records are kept by well-organized companies, practically all of which have a safety department in charge of a competent engineer. It is believed that the accident records shown by both the copper and iron mines represent more nearly the actual hazard in the metal-mining industry of the United States than do the records of any other group.

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

The data on accidents in and about the gold, silver, and miscellaneous metal mines, shown in Tables 8 and 9, are compiled from the reports of 3,166 operators, employing 51,892 men, of whom 35,812 were employed underground and 16,080 on the surface. The number of employees at this group of mines was about 8,200 less than in 1916. The number of deaths and injuries from accidents and the rates per 1,000 300-day employees are as follows: Deaths 196, or 4.03 per 1,000 as compared with 4.05 in 1916; injuries (Table 18) 8,385 or 172.51 per 1,000 as compared with 190.79 for 1916. Of the total number of fatalities, 166 were underground, or 4.82 per 1,000, and 30 on the surface, or 2.12 per 1,000.

The rates of nonfatal injuries are low as compared with those at iron and copper mines. The difference may be explained largely by this group including many prospects and small mines that keep no records, and by many of the mines being in States where there is no inspection and the operators are not required to report accidents. At such mines any accidents that are not serious are forgotten, and therefore not reported at the close of the year.

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IRON MINES.

The figures on accidents at iron mines given in Tables 10 and 11 are compiled from the reports of 205 iron-mine operators, who employed 57,230 men, of whom 31,549 were employed underground and 25,681, including those engaged in steam-shovel work, on the surface.

The number of deaths and injuries from accidents in these mines is as follows: Deaths, 191, or 3.54 per 1,000 300-day employees, as compared with 3.41 in 1916; injuries, (Table 18) 12,278 or 227.54 per 1,000, as compared with 240.17 in 1916. Of the total number of fatalities, 135 occurred underground, or 4.35 per 1,000 300-day workers underground; and 56 employees were killed while engaged in surface work, making this rate 2.44 per 1,000 300-day workers on the surface.

The injury rates at the iron mines, as at the copper mines, seem high, but, as already noted, the iron mines, like the copper mines, are operated by well-organized companies that conduct safety campaigns and keep excellent records of accidents. Compared with the records of 1911, there is a small decrease in the accidents, both fatal and nonfatal, regardless of the conditions prevailing during the stress of war. The well-kept records are showing the real hazard of the mining industry.

LEAD AND ZINC MINES.

Only the lead and zinc mines in the Mississippi Valley are included in this group. The lead and zinc mines of other States are grouped with "gold, silver, and miscellaneous metal mines" on account of the difficulty of making distinct classifications. In many places, for instance in the lead-silver mines in the Coeur d'Alene district of Idaho, lead and zinc occur as associated metals in silver ores. The Mississippi Valley lead and zinc mines form a class by themselves and are easily segregated.

The figures given in Tables 12 and 13 are compiled from the reports of 369 operators, employing 20,269 men of whom 15,075 were employed underground and 5,194 on the surface.

The total number of deaths and injuries due to accidents as reported is as follows: Deaths, 68, or 4.09 per 1,000 300-day employees, as compared with 3.14 in 1916; injuries (Table 18) 4,544, or 272.99 per 1,000 as compared with 263.09 in 1916. Of the total number of fatalities, 65 occurred underground, making the rate 5.22 per 1,000; the surface fatalities were 3 or 0.71 per 1,000 300-day workers.

NONMETALLIC MINERAL MINES.

Tables 14 and 15 represent the reports of 248 operators of nonmetallic mineral mines. These mines employed 9,913 men, of whom 2,726 worked underground and 7,187 on the surface.

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The total number of reported deaths and injuries from accidents is as follows: Deaths, 23, or 2.48 per 1,000 300-day workers as compared with 3.00 in 1916; injuries (Table 18), 1,144, or 123.58 per 1,000, as compared with 144.70 in 1916. Compared with the nonfatal-injury rates for the copper and iron mines, these ratios seem exceedingly low; the reports indicate that this difference is largely explainable by the mines being small and not keeping complete records. About 75 per cent of the men are employed on the surface, the hazards being thus reduced to those of quarry operations.

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TABLE 6.—*COPPER MINES: Men employed, number killed, and days worked, by States, during the year ended Dec. 31, 1917.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	On the surface.	Total.	Underground.	Surface.	Total		Underground.	On the surface.	Total.		
Alaska	15	404	365	**769**	134,936	121,910	256,846	334	3	1	**4**	1	2
Arizona	204	13,906	5,178	**19,084**	4,295,580	1,550,102	5,845,682	306	65	3	**68**	32	74
California	59	1,086	959	**2,045**	363,151	320,684	683,835	350	7	1	**8**	.....	.....
Idaho	46	396	119	**515**	97,451	21,449	118,900	231	1	.....	**1**	1	6
Michigan	34	10,414	4,927	**15,341**	3,220,250	1,524,249	4,744,499	309	43	3	**46**	23	64
Montana	48	11,850	956	**12,806**	3,631,223	293,073	3,924,296	306	[a] 206	2	**208**	72	155
Nevada	56	1,428	1,113	**2,541**	479,946	371,979	851,925	335	10	5	**15**	3	6
New Mexico	41	1,264	1,357	**2,621**	632,349	211,204	843,553	322	2	3	**5**	1	3
Oregon	26	178	107	**285**	42,424	19,611	62,035	218	.....	.....	.....	.....	.....
Utah	52	1,964	2,080	**4,044**	677,887	745,209	1,423,096	352	12	4	**16**	7	16
Washington	47	233	190	**423**	57,508	47,519	105,027	248	1	.....	**1**	.....	.....
Other States	21	592	209	**801**	171,997	53,872	225,869	282	2	.....	**2**	2	10
Total, 1917	**649**	**43,715**	**17,560**	**61,275**	**13,804,702**	**5,280,861**	**19,085,563**	**312**	**352**	**22**	**374**	**142**	**336**
Total, 1916	604	43,215	18,013	**61,228**	13,362,392	5,569,750	18,932,142	309	188	42	**230**	84	157
Total, 1915	548	32,421	14,753	**47,174**	9,766,986	4,444,414	14,211,400	301	143	33	**176**	99	186
Total, 1914	585	31,265	13,421	**44,686**	8,987,171	3,857,887	12,845,058	287	147	18	**165**	69	106
Total, 1913	694	39,917	16,222	**56,139**	12,350,220	5,019,046	17,369,266	327	203	33	**236**	100	180
Total, 1912	814	37,539	14,237	**51,776**	11,478,084	4,353,166	15,831,250	306	185	54	**239**	87	159
Total, 1911	396	31,557	13,136	**44,693**	9,725,827	4,048,498	13,774,325	308	199	39	**238**	91	195

[a] See footnote [a], Table 1.

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TABLE 7.—***COPPER MINES:*** *Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.[a]		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
Alaska	450	406	**856**	6.67	2.46	**4.67**	.....	.....	.....
Arizona	14,319	5,167	**19,486**	4.54	.58	**3.49**	.....	.....	.....
California	1,211	1,069	**2,280**	5.78	.94	**3.51**	.....	.....	.....
Idaho	325	71	**396**	3.08	.....	**2.53**	.....	.....	.....
Michigan	10,734	5,081	**15,815**	4.01	.59	**2.91**	.....	.....	.....
Montana	12,104	977	**13,081**	17.02	2.05	**15.90**	.....	.....	.....
Nevada	1,600	1,240	**2,840**	6.25	4.03	**5.28**	.....	.....	.....
New Mexico	2,108	704	**2,812**	.95	4.26	**1.78**	.....	.....	.....
Oregon	142	65	**207**	.....	.....	.....	.....	.....	.....
Utah	2,260	2,484	**4,744**	5.31	1.61	**3.37**	.....	.....	.....
Washington	192	158	**350**	5.21	.....	**2.86**	.....	.....	.....
Other States	573	180	**753**	3.49	.....	**2.66**	.....	.....	.....
Total, 1917	**46,016**	**17,603**	**63,619**	**7.65**	**1.25**	**[b] 5.88**	**359.27**	**193.32**	**313.35**
Total, 1916	44,541	18,566	**63,107**	4.22	2.26	**3.64**	373.66	189.86	**319.58**
Total, 1915	32,556	14,815	**47,371**	4.39	2.23	**3.72**	384.74	184.15	**322.01**
Total, 1914	29,957	12,860	**42,817**	4.91	1.40	**3.85**	368.49	181.03	**312.19**
Total, 1913	41,168	16,730	**57,898**	4.93	1.97	**4.08**	265.69	144.95	**230.80**
Total, 1912	38,260	14,511	**52,771**	4.84	3.72	**4.53**	307.84	128.11	**258.42**
Total, 1911	32,419	13,495	**45,914**	6.14	2.89	**5.18**	271.32	114.56	**225.25**

[a] Injury rates not given by States, but rates for the entire copper-mining industry, by years, are given, based on the total injuries shown in Table 18.
[b] Excluding the deaths from the fire at the North Butte mine, the fatality rate for 1917 was 3.34 per 1,000, the lowest on record for the copper group.

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TABLE 8.—*GOLD, SILVER, AND MISCELLANEOUS METAL MINES: Men employed, number killed, and days worked, by States, during the year ended Dec. 31, 1917.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	On the surface.	Total.	Underground.	Surface.	Total.		Underground.	On the surface.	Total.		
Alaska	347	4,396	2,411	**6,807**	916,637	496,692	**1,413,329**	208	18	8	**26**	6	2
Arizona	241	2,151	1,053	**3,204**	569,642	254,321	**823,963**	257	11	1	**12**	6	17
California	555	4,841	2,909	**7,750**	1,636,288	981,483	**2,617,771**	338	28	6	**34**	.....	.....
Colorado	407	6,793	756	**7,549**	2,038,111	226,772	**2,264,883**	300	44	3	**47**	.....	.....
Georgia	12	48	173	**221**	11,462	41,468	**52,930**	240	.....	.....	.....	.....	.....
Idaho	364	3,904	1,676	**5,580**	1,143,478	392,618	**1,536,096**	275	18	5	**23**	8	10
Montana	233	2,554	863	**3,417**	723,590	202,881	**926,471**	271	4	2	**6**	.....	.....
Nevada	342	3,001	1,149	**4,150**	860,763	294,061	**1,154,824**	278	10	3	**13**	6	4
New Mexico	88	1,039	648	**1,687**	327,968	161,075	**489,043**	290	7	.....	**7**	1	4
New York	3	190	33	**223**	59,285	10,627	**69,912**	314	1	.....	**1**	.....	.....
North Carolina	6	39	66	**105**	6,901	12,013	**18,914**	180	1	.....	**1**	.....	.....
Oregon	156	465	435	**900**	110,028	72,950	**182,978**	203	1	.....	**1**	1	.....
South Dakota	56	1,312	791	**2,103**	437,315	259,239	**696,554**	331	7	.....	**7**	3	7
Texas	6	357	120	**477**	120,800	38,545	**159,345**	334	.....	.....	.....	.....	.....
Utah	169	3,009	713	**3,722**	929,481	201,861	**1,131,342**	304	9	.....	**9**	4	11
Virginia	20	305	618	**923**	82,430	159,446	**241,876**	262	3	.....	**3**	2	5
Washington	115	354	226	**580**	58,646	36,443	**95,089**	164	.....	2	**2**	2	.....
Wyoming	23	31	35	**66**	2,457	2,196	**4,653**	71	.....	.....	.....	.....	.....
Other States	23	1,023	1,405	**2,428**	306,526	395,312	**701,838**	289	4	.....	**4**	2	.....
Total, 1917	**3,166**	**35,812**	**16,080**	**51,892**	**10,341,808**	**4,240,003**	**14,581,811**	**281**	**166**	**30**	**196**	**41**	**60**
Total, 1916	3,921	42,158	17,949	**60,107**	11,286,467	4,805,275	**16,091,742**	268	190	27	**217**	71	116
Total, 1915	3,120	29,163	16,149	**45,312**	8,027,472	4,445,210	**12,472,682**	275	168	31	**199**	77	133
Total, 1914	3,536	35,432	13,006	**48,438**	9,685,888	3,555,392	**13,241,280**	273	154	25	**179**	60	87
Total, 1913	4,749	44,810	14,691	**59,501**	12,376,094	4,057,514	**16,433,608**	276	180	30	**210**	67	70
Total, 1912	4,137	31,322	12,822	**44,144**	8,677,523	3,552,238	**12,229,761**	277	147	29	**176**	71	98
Total, 1911	3,817	35,176	13,743	**48,919**	9,716,478	3,796,155	**13,512,633**	276	163	30	**193**	61	118

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TABLE 9.—***GOLD, SILVER, AND MISCELLANEOUS METAL MINES:*** *Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.[a]		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
Alaska	3,055	1,656	4,711	5.89	4.83	5.52	.....	.....	.....
Arizona	1,899	848	2,747	5.79	1.18	4.37	.....	.....	.....
California	5,454	3,272	8,726	5.13	1.83	3.90	.....	.....	.....
Colorado	6,793	756	7,549	6.48	3.97	6.23	.....	.....	.....
Georgia	38	138	176	.....	.....	.....	.....	.....	.....
Idaho	3,811	1,309	5,120	4.72	3.82	4.49	.....	.....	.....
Montana	2,412	676	3,088	1.65	2.96	1.94	.....	.....	.....
Nevada	2,869	980	3,849	3.49	3.06	3.38	.....	.....	.....
New Mexico	1,093	537	1,630	6.40	.....	4.29	.....	.....	.....
New York	198	35	233	5.05	.....	4.29	.....	.....	.....
North Carolina	23	40	63	43.48	.....	15.87	.....	.....	.....
Oregon	367	243	610	2.72	.....	1.64	.....	.....	.....
South Dakota	1,458	864	2,322	4.80	.....	3.01	.....	.....	.....
Texas	403	128	531	.....	.....	.....	.....	.....	.....
Utah	3,098	673	3,771	2.91	.....	2.39	.....	.....	.....
Virginia	275	531	806	10.91	.....	3.72	.....	.....	.....
Washington	196	121	317	.....	16.53	6.31	.....	.....	.....
Wyoming	8	7	15	.....	.....	.....	.....	.....	.....
Other States	1,022	1,317	2,339	3.91	.....	1.71	.....	.....	.....
Total, 1917	**34,473**	**14,133**	**48,606**	**4.82**	**2.12**	**4.03**	**207.23**	**87.81**	**172.51**
Total, 1916	37,621	16,018	53,639	5.05	1.69	4.05	221.29	119.18	190.79
Total, 1915	26,758	14,818	41,576	6.28	2.09	4.79	261.23	93.60	201.49
Total, 1914	32,286	11,852	44,138	4.77	2.11	4.06	144.21	79.73	126.90
Total, 1913	41,254	13,525	54,779	4.36	2.22	3.83	80.60	39.19	70.37
Total, 1912	28,925	11,841	40,766	5.08	2.45	4.32	114.47	40.71	93.04
Total, 1911	32,388	12,654	45,042	5.03	2.37	4.28	99.79	30.50	80.33

[a] Injury rates not given by States, but rates for the entire gold and silver mining industry, by years, are given, based on the total injuries shown in Table 18.

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TABLE 10.—***IRON MINES:*** *Men employed, number killed, and days worked, by States, during the year ended Dec. 31, 1917.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	On the surface.	Total.	Underground.	On the surface.	Total.		Underground.[a]	On the surface.	Total.		
Alabama	24	5,704	2,985	8,689	1,733,735	725,542	2,459,277	283	28	4	32	11	16
Georgia	6	221	284	505	64,984	71,755	136,739	271	2	.....	2	.....	.....
Michigan	47	11,305	5,634	16,939	3,355,251	1,451,173	4,806,424	284	54	9	63	36	92
Minnesota	60	9,280	12,239	21,519	2,675,059	3,446,247	6,121,306	284	31	32	63	22	40
Missouri	4	70	93	163	20,086	21,646	41,732	256	.....	1	1	.....	.....
New Jersey	5	715	540	1,255	207,057	122,113	329,170	262	3	2	5	4	8
New Mexico	5	116	547	663	19,352	139,385	158,737	239	.....	1	1	.....	.....
New York	9	1,679	724	2,403	511,272	214,304	725,576	302	7	1	8	5	11
Pennsylvania	3	.....	272	272	.....	78,100	78,100	287	.....	.....	.....	.....	.....
Tennessee	11	425	709	1,134	122,980	175,933	298,913	264	1	1	2	1	2
Virginia	8	547	885	1,432	157,080	228,913	385,993	270	.....	4	4	2	3
Wisconsin	5	1,008	281	1,289	298,614	80,117	378,731	294	6	.....	6	3	16
Other States	18	479	488	967	144,143	123,210	267,353	276	3	1	4	1	2
Total, 1917	205	31,549	25,681	57,230	9,309,613	6,878,438	16,188,051	283	135	56	191	85	190
Total, 1916	199	30,485	23,003	53,488	8,474,524	6,394,603	14,869,127	278	133	36	169	88	222
Total, 1915	191	23,302	16,089	39,391	6,336,042	4,374,756	10,710,798	272	78	25	103	67	127
Total, 1914	196	24,847	19,960	44,807	6,513,543	5,232,435	11,745,978	262	120	28	148	86	178
Total, 1913	206	29,384	21,749	51,133	8,656,898	6,407,531	15,064,429	295	122	43	165	81	178
Total, 1912	194	26,799	18,947	45,746	7,636,470	5,399,015	13,035,485	285	136	36	172	84	198
Total, 1911	207	25,461	20,492	45,953	7,063,856	5,685,265	12,749,121	277	136	61	197	114	237

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TABLE 11.—*IRON MINES: Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers. [a]		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface	Total.
Alabama	5,779	2,418	8,197	4.85	1.65	3.90	.....	.....	.....
Georgia	217	239	456	9.22	.....	4.39	.....	.....	.....
Michigan	11,184	4,837	16,021	4.83	1.86	3.93	.....	.....	.....
Minnesota	8,917	11,487	20,404	3.48	2.79	3.09	.....	.....	.....
Missouri	67	72	139	.....	13.89	7.19	.....	.....	.....
New Jersey	690	407	1,097	4.35	4.91	4.56	.....	.....	.....
New Mexico	64	465	529	.....	2.15	1.89	.....	.....	.....
New York	1,704	714	2,418	4.11	1.40	3.31	.....	.....	.....
Pennsylvania	.....	260	260	.....	.....	.....	.....	.....	.....
Tennessee	410	586	996	2.44	1.71	2.01	.....	.....	.....
Virginia	524	763	1,287	.....	5.24	3.11	.....	.....	.....
Wisconsin	995	267	1,262	6.03	.....	4.75	.....	.....	.....
Other States	480	411	891	6.25	2.43	4.49	.....	.....	.....
Total, 1917	**31,032**	**22,928**	**53,960**	**4.35**	**2.44**	**3.54**	**285.90**	**148.55**	**227.54**
Total, 1916	28,248	21,316	49,564	4.71	1.69	3.41	327.32	124.70	240.17
Total, 1915	21,120	14,583	35,703	3.69	1.71	2.88	313.97	116.99	233.51
Total, 1914	21,712	17,441	39,153	5.53	1.61	3.78	303.29	125.45	224.07
Total, 1913	28,856	21,359	50,215	4.23	2.01	3.29	341.84	168.98	268.31
Total, 1912	25,455	17,997	43,452	5.34	2.00	3.96	308.54	147.41	241.81
Total, 1911	23,546	18,951	42,497	5.78	3.22	4.64	333.14	151.87	252.30

[a] Injury rates not given by States, but rates for the entire iron-mining industry, by years, are given, based on the total injuries shown in Table 18.

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TABLE 12.—*LEAD AND ZINC MINES (Mississippi Valley): Men employed, number killed, and days worked, by States, during the year ended Dec. 31, 1917.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	On the surface.	Total.	Underground.	On the surface.	Total.		Underground.[a]	On the surface.	Total.		
Arkansas	33	308	264	**572**	59,595	56,255	**115,850**	203	.....	.....	.....	.....	.....
Illinois	10	420	247	**667**	112,598	67,041	**179,639**	269	3	.....	**3**	3	5
Kansas	24	544	238	**782**	123,764	49,649	**173,413**	222	3	.....	**3**	3	8
Missouri	191	9,195	2,395	**11,590**	2,329,808	599,767	**2,929,575**	253	34	1	**35**	21	45
Oklahoma	39	2,169	669	**2,838**	463,435	152,673	**616,108**	217	18	.....	**18**	11	13
Tennessee	3	609	283	**892**	188,341	86,185	**274,526**	308	4	.....	**4**	3	9
Wisconsin	46	1,638	777	**2,415**	415,339	191,899	**607,238**	251	3	2	**5**	2	2
Other States	23	192	321	**513**	40,464	56,577	**97,041**	189	.....	.....	.....	.....	.....
Total, 1917	**369**	**15,075**	**5,194**	**20,269**	**3,733,344**	**1,260,046**	**4,993,390**	**246**	**65**	**3**	**68**	**43**	**82**
Total, 1916	285	14,687	5,928	**20,615**	3,877,523	1,565,055	**5,442,578**	264	52	5	**57**	31	61
Total, 1915	241	9,493	3,484	**12,977**	2,450,891	899,495	**3,350,386**	258	54	6	**60**	23	28
Total, 1914	248	7,609	3,326	**10,935**	1,933,813	845,296	**2,779,109**	254	37	3	**40**	23	53
Total, 1913	409	9,261	3,436	**12,697**	2,353,484	873,185	**3,226,669**	254	32	10	**42**	25	46
Total, 1912	464	10,812	3,520	**14,332**	2,853,837	929,107	**3,782,944**	265	48	6	**54**	26	62
Total, 1911	483	9,247	3,274	**12,521**	2,364,989	837,350	**3,202,339**	256	32	11	**43**	26	40

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TABLE 13.—*LEAD AND ZINC MINES (Mississippi Valley only): Fatalities and injuries per 1,000 300-day workers.*[a]

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
Arkansas	199	187	386	.....	.....	.....	.....	.....	.....
Illinois	375	224	599	8.00	.....	5.01	.....	.....	.....
Kansas	413	165	578	7.26	.....	5.19	.....	.....	.....
Missouri	7,766	1,999	9,765	4.38	.50	3.58	.....	.....	.....
Oklahoma	1,545	509	2,054	11.65	.....	8.76	.....	.....	.....
Tennessee	628	287	915	6.37	.....	4.37	.....	.....	.....
Wisconsin	1,384	640	2,024	2.17	3.13	2.47	.....	.....	.....
Other States	135	188	323	.....	.....	.....	.....	.....	.....
Total, 1917	12,444	4,200	16,644	5.22	.71	4.09	303.50	182.62	272.99
Total, 1916	12,925	5,217	18,142	4.02	.96	3.14	297.41	178.07	263.09
Total, 1915	8,170	2,998	11,168	6.61	2.00	5.37	290.09	97.06	238.27
Total, 1914	6,446	2,818	9,264	5.74	1.06	4.32	228.82	97.94	189.01
Total, 1913	7,845	2,911	10,756	4.08	3.44	3.90	145.44	101.34	133.51
Total, 1912	9,513	3,097	12,610	5.05	1.94	4.28	183.75	80.08	158.29
Total, 1911	7,883	2,791	10,674	4.06	3.94	4.03	164.91	67.36	139.40

[a] Injury rates not given by States, but rates for the lead and zinc industry of the Mississippi Valley, by years, are given below, based on the total injuries shown in Table 18.

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TABLE 14.—*NONMETALLIC MINERAL MINES: Men employed, number killed, and days worked, by States, during the year ended Dec. 31, 1917.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	On the surface.	Total.	Underground.	On the surface.	Total.		Underground.[a]	On the surface.	Total.		
California	14	173	155	328	61,865	53,630	115,495	352	2	.....	2	.....	.....
Florida	15	50	2,451	2,501	15,000	722,887	737,887	295	.....	7	7	4	11
Georgia	11	42	147	189	14,250	37,447	51,697	274	.....	2	2	2	2
Iowa	5	248	24	272	62,723	6,099	68,822	253	.....	.....	.....	.....	.....
Maine	3	.....	69	69	.....	18,050	18,050	262	.....	.....	.....	.....	.....
Michigan	5	135	108	243	35,900	24,134	60,034	247	.....	.....	.....	.....	.....
New York	21	685	594	1,279	308,789	152,324	461,113	361	4	.....	4	4	8
North Carolina	15	45	489	534	10,825	95,769	106,594	200	.....	.....	.....	.....	.....
Ohio	4	215	6	221	38,540	1,500	40,040	181	.....	.....	.....	.....	.....
Pennsylvania	15	37	195	232	10,620	45,470	56,090	242	.....	.....	.....	.....	.....
Tennessee	11	110	747	857	22,000	180,806	202,806	237	1	2	3	1	.....
Utah	9	98	57	155	19,073	12,036	31,109	201	1	.....	1	1	1
Vermont	5	59	31	90	18,540	8,565	27,105	301	.....	.....	.....	.....	.....
Virginia	8	138	177	315	40,870	49,641	90,511	287	1	.....	1	1	.....
Other States	107	691	1,937	2,628	196,143	513,500	709,643	270	.....	3	3	2	6
Total, 1917	**248**	**2,726**	**7,187**	**9,913**	**855,138**	**1,921,858**	**2,776,996**	**280**	**9**	**14**	**23**	**15**	**28**
Total, 1916	249	2,618	6,629	9,247	679,722	1,721,114	2,400,836	260	11	13	24	11	18
Total, 1915	222	1,844	5,420	7,264	470,583	1,383,166	1,853,749	255	8	7	15	9	10
Total, 1914	240	2,465	6,784	9,249	580,285	1,597,021	2,177,306	235	8	19	27	14	18
Total, 1913	329	2,997	8,809	11,806	757,471	2,226,412	2,983,883	253	11	19	30	13	27
Total, 1912	358	3,584	9,617	13,201	982,558	2,636,512	3,619,070	274	6	14	20	5	3
Total, 1911	329	3,182	10,711	13,893	821,817	2,766,338	3,588,155	258	12	12	24	5	10

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TABLE 15.—*NONMETALLIC MINERAL MINES: Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.[a]		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
California	206	179	385	9.71	.....	5.19	.....	.....	.....
Florida	50	2,410	2,460	.....	2.90	2.85	.....	.....	.....
Georgia	47	125	172	.....	16.00	11.63	.....	.....	.....
Iowa	209	20	229	.....	.....	.....	.....	.....	.....
Maine	.....	60	60	.....	.....	.....	.....	.....	.....
Michigan	120	80	200	.....	.....	.....	.....	.....	.....
New York	1,029	508	1,537	3.89	.....	2.60	.....	.....	.....
North Carolina	36	319	355	.....	.....	.....	.....	.....	.....
Ohio	128	5	133	.....	.....	.....	.....	.....	.....
Pennsylvania	35	152	187	.....	.....	.....	.....	.....	.....
Tennessee	73	603	676	13.70	3.32	4.44	.....	.....	.....
Utah	64	40	104	15.63	.....	9.62	.....	.....	.....
Vermont	62	28	90	.....	.....	.....	.....	.....	.....
Virginia	136	166	302	7.35	.....	3.31	.....	.....	.....
Other States	654	1,711	2,365	.....	1.75	1.27	.....	.....	.....
Total, 1917	**2,850**	**6,406**	**9,256**	**3.16**	**2.19**	**2.48**	**150.82**	**111.46**	**123.58**
Total, 1916	2,266	5,737	8,003	4.85	2.27	3.00	172.55	133.69	144.70
Total, 1915	1,569	4,610	6,179	5.10	1.52	2.43	135.12	98.48	107.78
Total, 1914	1,934	5,324	7,258	4.14	3.57	3.72	125.13	90.53	99.75
Total, 1913	2,525	7,421	9,946	4.36	2.56	3.02	101.78	79.10	84.86
Total, 1912	3,275	8,789	12,064	1.83	1.59	1.66	51.60	71.91	66.40
Total, 1911	2,740	9,221	11,961	4.38	1.30	2.01	75.18	21.80	34.03

[a] Injury rates not given by States, but rates for the entire nonmetallic-mineral industry, by years, are given, based on the total injuries shown in Table 18.

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes, and*

COPPER MINES.

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alaska	2						1			
Arizona	31	1		7	8	4	1		2	
California	3					1				
Idaho	1									
Michigan	14	2		1	2	1				
Montana	18	1	1	7	1	3				
Nevada	1	1		1	2	1			1	
New Mexico						1				
Oregon										
Utah	4			3		4				
Washington	1									
Other States		1								
Total, 1917	**75**	**6**	**1**	**19**	**13**	**15**	**2**		**3**	
Total, 1916	66	3		18	7	14	3		7	
Total, 1915	69	2	4	16	5	13	2		5	
Total, 1914	57	2	1	14	10	22	4	1	5	
Total, 1913	76	2	1	23	20	25	6		6	
Total, 1912	87		4	21	9	16	6	1	9	
Total, 1911	82		6	18	5	19	6		6	3

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

Alaska	5	1		3		3	1			
Arizona	1			2		6				
California	7			10					1	
Colorado	13	1	1	3	2	7	1			
Georgia										
Idaho	6			1		4			1	1
Montana	1			1		1	1			
Nevada	4								1	
New Mexico				2		1			2	
New York					1					
North Carolina										
Oregon										
South Dakota	2			2		2				
Tennessee										
Utah	3			4		1				
Virginia						1				
Washington										
Wyoming										
Other States					1				1	
Total, 1917	**42**	**2**	**1**	**28**	**4**	**26**	**3**		**6**	**1**
Total, 1916	66	5	1	28	9	13	4		5	1
Total, 1915	49	4	2	37	7	23	5	1	4	
Total, 1914	52	1		22	6	21	1	2	3	
Total, 1913	68	1	3	35	2	21	2		5	4
Total, 1912	49	1	1	27	7	17	2		5	
Total, 1911	40		2	24	7	18	6		7	5

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States, during the year ended Dec. 31, 1917.

COPPER MINES.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	2	57	4	1	.....	1	.....	2	8
.....	.....	.....	.....	2	6	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
.....	2	2	.....	4	28	3	1	.....	.....	8	3	15
164	.....	.....	.....	2	197	1	4	.....	.....	4	.....	9
.....	.....	.....	.....	1	8	1	.....	.....	.....	1	.....	2
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	1	12	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	1
164	3	2	.....	12	315	9	6	.....	1	15	6	37
23	1	.....	.....	8	150	17	2	.....	.....	13	6	38
.....	.....	.....	1	2	119	8	3	1	1	9	2	24
2	.....	.....	.....	1	119	9	2	.....	.....	15	3	28
.....	.....	.....	.....	12	171	8	7	.....	1	9	6	32
.....	1	.....	.....	3	157	11	2	.....	.....	14	1	28
12	2	.....	.....	1	160	17	5	.....	.....	.....	17	39

GOLD, SILVER AND MISCELLANEOUS METAL MINES.

.....	.....	.....	.....	1	14	.....	1	.....	.....	3	.....	4
.....	.....	.....	.....	1	10	1	.....	.....	.....	.....	.....	1
.....	.....	1	.....	1	20	2	3	.....	.....	3	.....	8
.....	.....	1	.....	1	30	3	5	2	.....	3	1	14
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	3	17	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	5	2	.....	.....	.....	2	1	5
.....	.....	.....	.....	.....	5	.....	1	.....	.....	1	.....	2
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	6	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	8	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	1	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	2	.....	.....	.....	2	.....	.....	2
1	.....	2	.....	7	123	10	10	2	2	16	3	43
4	4	.....	.....	10	150	16	6	2	2	11	3	40
.....	2	.....	.....	.....	134	19	6	.....	.....	6	3	34
4	1	.....	.....	3	116	13	2	2	.....	19	2	38
.....	3	.....	.....	6	150	10	5	.....	.....	13	2	30
1	3	.....	.....	1	114	16	2	2	.....	10	3	33
17	5	.....	.....	2	133	16	8	3	.....	.....	3	30

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes, and*

COPPER MINES.

State.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall or ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Alaska										
Arizona	2	1								3
California		1								1
Idaho										
Michigan	1	1							1	3
Montana	1							1		2
Nevada										
New Mexico										
Oregon										
Utah										
Washington										
Other States										
Total, 1917	**4**	**3**						**1**	**1**	**9**
Total, 1916	3	3		4			1	5	5	**21**
Total, 1915	1	3		2		16		1	1	**24**
Total, 1914	2	2		1					3	**8**
Total, 1913	1	2					2	3	1	**9**
Total, 1912	1	5		4			3	3	15	**31**
Total, 1911		3	1				1	3	14	**22**

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

Alaska				1			1		5	**7**
Arizona									1	**1**
California				4					1	**5**
Colorado									2	**2**
Georgia										
Oregon				1					3	**4**
Montana							2			**2**
Nevada							1	2		**3**
New Mexico										
New York										
North Carolina										
Oregon										
South Dakota										
Tennessee										
Utah										
Virginia										
Washington				2						**2**
Wyoming										
Other States										
Total, 1917				**8**			**4**	**2**	**12**	**26**
Total, 1916	1	1		3			5	2	13	**25**
Total, 1915	2	1					1	5	2	**11**
Total, 1914		2	2				3	2	2	**11**
Total, 1913	2	1		2	1		1	5	6	**18**
Total, 1912	3						1	5	3	**12**
Total, 1911	3		1				1	3	17	**25**

[a] Not segregated.

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States during the year ended Dec. 31, 1917—Continued.

COPPER MINES.

Open pit.												Grand total.						
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.							
31	32	33	34	35	36	37	38	39	40	41		1917	1916	1915	1914	1913	1912	1911
1	....	....	....	....	....	....	....	....	....	....	1	4	7	4	2	.....	12	.....
....	....	....	....	....	....	....	....	....	....	....	.....	68	53	34	57	74	60	61
....	....	....	....	....	....	....	....	....	....	....	.....	8	10	5	3	9	9	2
....	....	....	....	....	....	....	....	....	....	....	.....	1	2	.....	3	3	1	3
....	....	....	....	....	....	....	....	....	....	....	.....	46	57	61	40	34	44	63
....	....	....	....	....	....	....	....	....	....	....	.....	208	61	51	33	60	48	50
1	....	4	....	....	....	....	....	....	....	....	5	15	10	1	6	10	18	12
2	....	1	....	....	....	....	....	....	....	....	3	5	12	2	1	16	8	4
....	....	....	....	....	....	....	....	....	....	....	.....	0	(a)	(a)	(a)	(a)	(a)	(a)
....	1	3	....	....	....	....	....	....	....	....	4	16	15	14	14	25	27	32
....	....	....	....	....	....	....	....	....	....	....	.....	1	.....	1	.....	2	1	2
....	....	....	....	....	....	....	....	....	....	....	.....	2	3	3	6	3	11	9
4	1	8	....	....	....	....	....	....	....	....	13	374	.....	.....	.....	.....	.....	.....
5	6	7	....	....	....	....	....	1	....	2	21	.....	230	.....	.....	.....	.....	.....
2	....	6	....	1	....	....	....	....	....	....	9	.....	.....	176	.....	.....	.....	.....
1	6	3	....	....	....	....	....	....	....	....	10	.....	.....	.....	165	.....	.....	.....
4	6	12	....	....	....	....	2	....	....	....	24	.....	.....	.....	.....	236	.....	.....
3	13	4	2	....	....	....	....	....	....	1	23	.....	.....	.....	.....	.....	239	.....
7	5	2	....	1	....	....	2	....	....	....	17	.....	.....	.....	.....	.....	.....	238

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

....	....	....	....	....	....	....	....	....	....	1	1	26	22	17	17	25	9	.....
....	....	....	....	....	....	....	....	....	....	....	.....	12	15	7	6	12	7	8
....	....	1	....	....	....	....	....	....	....	....	1	34	32	44	37	42	31	36
....	....	....	....	1	....	....	....	....	....	....	1	47	62	47	45	44	46	43
....	....	....	....	....	....	....	....	....	....	....	.....	.....	2	1	.....	.....	.....	.....
....	1	....	....	....	....	....	....	....	....	....	1	23	13	25	22	21	28	20
....	....	....	....	....	....	....	....	....	....	....	.....	6	14	11	6	4	2	12
....	....	....	....	....	....	....	....	....	....	....	.....	13	18	17	16	15	16	37
....	....	....	....	....	....	....	....	....	....	....	.....	7	9	2	2	9	3	4
....	....	....	....	....	....	....	....	....	....	....	.....	1	(a)	(a)	(a)	(a)	(a)	(a)
....	....	....	....	....	....	....	....	....	....	....	.....	1	.....	.....	3	2	1	2
....	....	....	....	....	....	....	....	....	....	....	.....	1	1	2	1	3	1	2
....	....	....	....	....	....	....	....	....	....	....	.....	7	6	6	4	8	6	8
....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	3	3	3	2	.....
....	....	....	....	....	....	....	....	....	....	....	.....	9	9	9	15	9	12	17
....	....	....	....	....	....	....	....	....	....	....	.....	3	1	.....	1	7	2	.....
....	....	....	....	....	....	....	....	....	....	....	.....	2	3	3	.....	2	3	1
....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....
....	....	....	....	....	....	....	....	....	....	....	.....	4	10	5	1	4	7	3
....	1	1	....	1	....	....	....	....	....	1	4	196	.....	.....	.....	.....	.....	.....
....	....	1	....	....	....	....	1	....	....	....	2	.....	217	.....	.....	.....	.....	.....
6	5	1	....	3	....	....	2	2	....	1	20	.....	.....	199	.....	.....	.....	.....
3	3	1	....	2	1	....	1	2	....	1	14	.....	.....	.....	179	.....	.....	.....
1	2	1	....	....	1	....	3	2	....	2	12	.....	.....	.....	.....	210	.....	.....
5	1	4	2	1	....	....	1	1	....	2	17	.....	.....	.....	.....	.....	176	.....
3	....	....	....	1	....	....	....	....	....	1	5	.....	.....	.....	.....	.....	.....	193

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes, and*

IRON MINES.

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alabama	22			2	2					
Georgia				1	1					
Michigan	20	2		3	4	7	2		1	1
Minnesota	14				5	2				
Missouri										
New Jersey	1							1		
New Mexico										
New York	1	2			3	1				
Pennsylvania										
Tennessee	1									
Virginia										
Wisconsin	1					3				
Other States				1	1					
Total, 1917	**60**	**4**		**7**	**16**	**13**	**2**	**1**	**1**	**1**
Total, 1916	53	1	1	15	16	12	3		3	
Total, 1915	42	3	1	6	4	8	3		1	
Total, 1914	51	3	1	8	13	5				
Total, 1913	52	7	3	11	12	4	2		4	
Total, 1912	55	1	1	15	17	9	1	1	2	2
Total, 1911	45		1	11	6	10	2			2

LEAD AND ZINC MINES.

Arkansas										
Illinois	1			1						
Kansas										
Missouri	14	3		7	3	1				
Oklahoma	5			3		1			1	
Tennessee	1			3						
Wisconsin	2			1						
Other States										
Total, 1917	**23**	**3**		**15**	**3**	**2**			**1**	
Total, 1916	27	1		10	1	1	1		1	1
Total, 1915	27	1		11	1	1				
Total, 1914	20	1	1	4						1
Total, 1913	16		1	7	1	1			1	
Total, 1912	18			9	1	1	1		3	
Total, 1911	18		1	3	2				2	

NONMETALLIC MINERAL MINES.

All States, 1917	**6**							**1**		**1**
All States, 1916	5			3					1	
All States, 1915	4			2	1					
All States, 1914	5			1	2					
All States, 1913	8			1		1				
All States, 1912	3			1	1					
All States, 1911	6			6						

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States, during the year ended Dec. 31, 1917—Continued.

IRON MINES.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
.....	.....	.....	.....	.....	26	.....	.....	.....	.....	2	.....	2
.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	1	42	8	2	1	.....	1	.....	12
.....	.....	.....	.....	.....	21	6	.....	.....	.....	3	1	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	2	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	7	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	4	1	.....	.....	.....	1	.....	2
.....	.....	.....	.....	.....	2	.....	.....	.....	.....	1	.....	1
.....	1	.....	.....	1	107	15	2	1	.....	9	1	28
.....	1	1	1	4	111	8	7	.....	.....	7	.....	22
.....	1	.....	.....	1	70	2	1	1	.....	3	1	8
2	.....	8	.....	2	93	10	4	.....	.....	7	6	27
.....	.....	.....	.....	3	98	6	2	2	1	11	2	24
.....	.....	5	.....	2	111	7	4	.....	.....	13	1	25
8	1	12	.....	5	103	23	3	1	.....	.....	6	33

LEAD AND ZINC MINES.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	2	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	1	.....	1	.....	1	.....	3
.....	.....	.....	.....	1	29	3	1	.....	.....	.....	1	5
.....	2	.....	.....	1	13	2	2	.....	.....	.....	1	5
.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2	.....	.....	2	51	7	3	1	.....	1	2	14
.....	.....	.....	1	.....	44	4	3	.....	.....	1	.....	8
.....	.....	3	.....	.....	44	5	2	.....	.....	2	1	10
2	.....	.....	.....	1	30	3	2	.....	.....	2	.....	7
.....	.....	.....	.....	1	28	1	1	.....	1	1	.....	4
.....	.....	.....	.....	2	35	5	4	.....	.....	.....	4	13
.....	.....	.....	.....	2	28	1	2	.....	.....	.....	1	4

NONMETALLIC MINERAL MINES.

.....	.....	.....	.....	1	9	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	1	10	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	7	.....	1	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	1	11	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	5	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	12	.....	.....	.....	.....	.....	.....	.....

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes, and*

IRON MINES.

State.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall or ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Alabama	1									1
Georgia										
Michigan				1				1	4	6
Minnesota	2			1					4	7
Missouri										
New Jersey									2	2
New Mexico										
New York								1		1
Pennsylvania										
Tennessee										
Virginia		2							1	3
Wisconsin										
Other States										
Total, 1917	3	2		2				2	11	20
Total, 1916	5	1	1	6	1			2	4	20
Total, 1915	1	2	1						3	7
Total, 1914	1	1	2	3			1	1	2	11
Total, 1913	4		2	3			1	1	4	15
Total, 1912	2		2	2			1	1	1	9
Total, 1911	1	2	1					2	4	10

LEAD AND ZINC MINES.

Arkansas										
Illinois										
Kansas										
Missouri				1						1
Oklahoma										
Tennessee										
Wisconsin							1		1	2
Other States										
Total, 1917				1			1		1	3
Total, 1916				2			1	1	1	5
Total, 1915				1					3	4
Total, 1914								1	1	2
Total, 1913	2	1					1	2		6
Total, 1912								1	4	5
Total, 1911		3							7	10

NONMETALLIC MINERAL MINES.

All States, 1917		2		2			1	1	1	7
All States, 1916			1			1		2	1	5
All States, 1915		1	1							2
All States, 1914		2	1				2			5
All States, 1913									1	1
All States, 1912								1	1	2
All States, 1911										

[a] Not segregated. [b] Included in gold, silver, and miscellaneous metal.

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States, during the year ended Dec. 31, 1917—Continued.

IRON MINES.

Open pit.												Grand total.						
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.							
31	32	33	34	35	36	37	38	39	40	41		1917	1916	1915	1914	1913	1912	1911
1	....	2	....	....	.....	.....	.....	.....	....	....	3	32	25	12	25	22	32	10
....	....	....	....	....	.....	.....	.....	.....	....	....	.....	2	(a)	(a)	(a)	(a)	(a)	(a)
....	....	2	....	....	.....	.....	1	.....	....	....	3	63	71	38	58	47	52	69
8	6	9	2	....	.....	.....	.....	.....	....	....	25	63	42	36	43	63	50	76
1	....	.....	.....	....	.....	.....	.....	.....	....	....	1	1	1	.....	.....	.....	.....	1
....	....	.....	.....	....	.....	.....	.....	.....	....	....	.....	5	5	4	3	5	7	20
....	....	.....	.....	1	.....	.....	.....	.....	....	....	1	1	(a)	(a)	(a)	(a)	(a)	(a)
....	....	.....	.....	....	.....	.....	.....	.....	....	....	.....	8	13	7	7	12	14	6
....	....	.....	.....	....	.....	.....	.....	.....	....	....	.....	.....	3	.....	.....	.....	2	1
1	....	.....	.....	....	.....	.....	.....	.....	....	....	1	2	1	1	4	1	1	2
....	1	.....	.....	....	.....	.....	.....	.....	....	....	1	4	1	1	1	3	2	5
....	....	.....	.....	....	.....	.....	.....	.....	....	....	.....	6	4	2	2	9	9	2
....	1	.....	.....	....	.....	.....	.....	.....	....	....	1	4	3	2	5	3	3	5
11	8	13	2	1	.....	.....	1	.....	....	....	36	191	.....	.....	.....	.....	.....	.....
2	6	5	1	....	1	.....	.....	.....	....	1	16	.....	169	.....	.....	.....	.....	.....
2	1	11	1	1	1	.....	.....	.....	....	1	18	.....	.....	103	.....	.....	.....	.....
7	2	5	1	1	.....	.....	1	.....	....	....	17	.....	.....	.....	148	.....	.....	.....
8	3	11	2	1	.....	.....	2	1	....	....	28	.....	.....	.....	.....	165	.....	.....
5	5	11	....	1	2	.....	2	.....	....	1	27	.....	.....	.....	.....	.....	172	.....
22	10	14	1	....	1	.....	.....	.....	....	3	51	.....	.....	.....	.....	.....	.....	197

LEAD AND ZINC MINES.

....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	1	.....	.....	.....	.....
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	3	44	3	.....	1	1	1
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	3	1	2	1	4	2	2
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	35	31	44	25	34	36	37
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	18	4	4	3	1	1	.....
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	4	4	(b)	(b)	(b)	(b)	(b)
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	5	13	6	9	2	13	1
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	2	.....	1	2
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	68	.....	.....	.....	.....	.....	.....
....	....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	.....	57	.....	.....	.....	.....	.....
....	....	1	.....	.....	.....	.....	.....	.....	....	1	2	.....	.....	60	.....	.....	.....	.....
....	....	.....	.....	.....	.....	.....	.....	.....	....	1	1	.....	.....	.....	40	.....	.....	.....
1	1	.....	.....	.....	.....	.....	1	.....	....	1	4	.....	.....	.....	.....	42	.....	.....
....	....	.....	.....	.....	.....	.....	1	.....	....	....	1	.....	.....	.....	.....	.....	54	.....
....	....	.....	.....	.....	.....	.....	.....	.....	....	1	1	.....	.....	.....	.....	.....	.....	43

NONMETALLIC MINERAL MINES.

2	....	1	....	....	.....	.....	.....	2	....	2	7	23	.....	.....	.....	.....	.....	.....
1	3	.....	....	2	.....	.....	.....	1	....	1	8	.....	24	.....	.....	.....	.....	.....
2	....	.....	....	1	.....	.....	.....	1	....	1	5	.....	.....	15	.....	.....	.....	.....
7	....	.....	....	1	.....	.....	3	1	....	2	14	.....	.....	.....	27	.....	.....	.....
3	....	6	....	....	.....	.....	2	2	....	5	18	.....	.....	.....	.....	30	.....	.....
3	2	1	....	1	.....	.....	2	....	....	3	12	.....	.....	.....	.....	.....	20	.....
3	1	5	....	1	.....	.....	.....	1	....	1	12	.....	.....	.....	.....	.....	.....	24

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TABLE 17.—*ALL MINES: Fatalities and injuries, by causes*

NUMBER KILLED.

Kind of mine.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Copper	75	6	1	19	13	15	2	.....	3	.....
Gold, silver, and miscellaneous metal	42	2	1	28	4	26	3	.....	6	1
Iron	60	4	.....	7	16	13	2	1	1	1
Lead and zinc (Mississippi Valley)	23	3	.....	15	3	2	.....	.....	1	.....
Nonmetallic mineral	6	.....	.....	.....	.....	.....	.....	1	.....	1
Total, 1917	**206**	**15**	**2**	**69**	**36**	**56**	**7**	**2**	**11**	**3**
Percentage of grand total killed	24.18	1.76	.23	8.10	4.23	6.57	.82	.23	1.29	.35
Percentage of class total killed	34.05	2.48	.33	11.40	5.95	9.26	1.16	.33	1.82	.50
Number killed per 1,000 300-day workers employed underground	1.62	.12	.02	.54	.28	.44	.06	.02	.09	.02

NUMBER INJURED.

Copper	4,500	2,351	1,760	223	2,142	446	246	802	25	134
Gold, silver, and miscellaneous metal	1,123	679	548	108	615	308	141	502	25	192
Iron	1,846	1,413	1,202	107	1,586	209	165	455	26	64
Lead and zinc (Mississippi Valley)	528	776	90	54	433	103	37	363	6	17
Nonmetallic mineral	35	114	18	7	49	8	1	25	3	11
Total, 1917	**8,032**	**5,333**	**3,618**	**499**	**4,825**	**1,074**	**590**	**2,147**	**85**	**418**
Percentage of grand total injured	17.35	11.52	7.82	1.08	10.42	2.32	1.28	4.64	.18	.90
Percentage of class total injured	22.70	15.07	10.22	1.41	13.64	3.03	1.67	6.07	.24	1.18
Number injured per 1,000 300-day workers employed underground	63.34	42.05	28.53	3.94	38.05	8.47	4.65	16.93	.67	3.30

1911–1916.

Fatalities, 1911 to 1916:										
Number (total United States)	1,216	39	36	407	172	275	60	6	85	19
Percentage of grand total	31.60	1.01	.93	10.58	4.47	7.15	1.56	.16	2.21	.49
Injuries, 1911 to 1916:										
Number (total United States)	43,216	19,698	18,849	2,642	22,936	5,526	5,489	10,408	341	2,625
Percentage of grand total	21.18	9.65	9.24	1.30	11.24	2.71	2.69	5.10	.17	1.29

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and kinds of mines, during the year ended Dec. 31, 1917.

NUMBER KILLED.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
164	3	2	.....	12	315	9	6	.....	1	15	6	37
1	.....	2	.....	7	123	10	10	2	2	16	3	43
.....	1	.....	.....	1	107	15	2	1	.....	9	1	28
.....	2	.....	.....	2	51	7	3	1	.....	1	2	14
.....	.....	.....	.....	1	9	.....	.....	.....	.....	.....	.....	.....
165	6	4	.....	23	605	41	21	4	3	41	12	122
19.37	.70	.47	.....	2.70	71.01	4.81	2.47	.47	.35	4.81	1.41	14.32
27.27	.99	.66	.....	3.80	100.00	33.61	17.21	3.28	2.46	33.61	9.84	100.00
1.30	.05	.03	.....	.18	4.77	.32	.17	.03	.02	.32	.10	.96

NUMBER INJURED.

39	31	3	296	3,172	16,170	18	121	3	1	90	129	362
3	14	1	191	2,351	6,801	29	65	8	3	107	131	343
3	9	.....	198	1,313	8,596	22	49	4	2	96	103	276
.....	10	.....	118	858	3,393	16	214	2	2	81	69	384
.....	.....	.....	11	144	426	.....	1	.....	.....	.....	3	4
45	64	4	814	7,838	35,386	85	450	17	8	374	435	1,369
.10	.14	.01	1.76	16.93	76.45	.18	.97	.04	.02	.81	.94	2.96
.13	.18	.01	2.30	22.15	100.00	6.21	32.87	1.24	.58	27.32	31.78	100.00
.35	.50	.03	6.42	61.81	279.04	.67	3.55	.14	.06	2.95	3.43	10.80

1911–1916.

75	25	29	3	74	2,521	236	86	14	6	167	73	532
1.95	.65	.75	.08	1.92	65.51	6.13	2.24	.36	.16	4.34	1.90	15.13
117	216	91	2,229	23,634	158,017	540	1,583	41	51	1,343	1,363	4,921
.06	.11	.04	1.09	11.58	77.45	.26	.78	.02	.02	.66	.67	2.41

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TABLE 17.—***ALL MINES:*** *Fatalities and injuries, by causes*

NUMBER KILLED.

Kind of mine.	Surface (shops and power plants).									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Handtools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Copper	4	3	.....	.....	.....	.....	.....	1	1	9
Gold, silver and miscellaneous metal	.....	.....	.....	8	.....	.....	4	2	12	26
Iron	3	2	.....	2	.....	.....	.....	2	11	20
Lead and zinc (Mississippi Valley)	.....	.....	.....	1	.....	.....	1	.....	1	3
Nonmetallic mineral	.....	2	.....	2	.....	.....	1	1	1	7
Total	7	7	.....	13	.....	.....	6	6	26	65
Percentage of grand total killed	.82	.82	.....	1.53	.....	.....	.70	.70	3.05	7.63
Percentage of class total killed	10.77	10.77	.....	20.00	.....	.....	9.23	9.23	40.00	100.00
Number killed per 1,000, 300-day workers employed on the surface	.11	.11	.....	.20	.....	.....	.09	.09	.40	1.00

NUMBER INJURED.

Copper	145	62	45	207	79	303	8	139	1,061	2,049
Gold, silver and miscellaneous metal	75	21	19	105	96	131	19	123	437	1,026
Iron	136	70	28	190	114	254	17	143	745	1,697
Lead and zinc (Mississippi Valley)	31	26	24	54	84	83	7	131	291	731
Nonmetallic mineral	24	44	7	37	47	48	4	41	250	502
Total	411	223	123	593	420	819	55	577	2,784	6,005
Percentage of grand total injured	.89	.48	.26	1.28	.91	1.77	.12	1.25	6.01	12.97
Percentage of class total injured	6.84	3.71	2.05	9.88	6.99	13.64	.92	9.61	46.36	100.00
Number injured per 1,000 300-day workers employed on the surface	6.30	3.42	1.88	9.09	6.43	12.55	.84	8.84	42.65	92.00

1911–1916.

Fatalities, 1911 to 1916:										
Number	35	36	16	33	2	1	26	52	135	336
Percentage of grand total	.91	.93	.41	.86	.05	.03	.68	1.35	3.51	8.73
Injuries, 1911 to 1916:										
Number	1,472	621	612	2,226	1,109	3,167	207	2,601	8,851	20,866
Percentage of grand total	.72	.31	.30	1.09	.54	1.55	.10	1.28	4.34	10.23

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and kinds of mines, during the year ended Dec. 31, 1917—Continued.

NUMBER KILLED.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		1917
4	1	8	.....	.....	.....	.....	.....	.....	.....	.....	13	374
.....	1	1	.....	1	.....	.....	.....	.....	.....	1	4	196
11	8	13	2	1	.....	.....	1	.....	.....	.....	36	191
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68
2	.....	1	.....	.....	.....	.....	.....	2	.....	2	7	23
17	10	23	2	2	.....	.....	1	2	.....	3	60	852
2.00	1.18	2.70	.23	.23	.....	.....	.12	.23	.....	.35	7.04	100.00
28.33	16.67	38.33	3.33	3.33	.....	.....	1.67	3.33	.....	5.00	100.00	.....
.26	.15	.35	.03	.03	.....	.....	.02	.03	.....	.05	.92	4.44

NUMBER INJURED.

304	24	117	67	147	8	4	37	1	84	561	1,354	19,935
43	11	23	.....	10	.....	1	11	1	22	93	215	8,385
206	65	269	233	143	3	16	51	1	211	511	1,709	12,278
3	.....	17	.....	.....	.....	1	.....	.....	3	12	36	4,544
23	18	17	9	11	.....	2	9	1	19	103	212	1,144
579	118	443	309	311	11	24	108	4	339	1,280	3,526	46,286
1.25	.26	.96	.67	.67	.02	.05	.23	.01	.73	2.77	7.62	100.00
16.42	3.35	12.57	8.76	8.82	.31	.68	3.06	.11	9.62	36.30	100.00	.....
8.87	1.81	6.79	4.73	4.77	.17	.37	1.65	.06	5.19	19.61	54.02	240.97

1911–1916.

106	81	112	10	19	7	.....	27	14	.....	33	409	3,848
2.76	2.11	2.91	.26	.49	.18	.....	.70	.36	.....	.86	10.63	100.00
3,537	763	2,292	1,338	1,897	198	93	1,291	69	1,936	6,812	20,226	204,030
1.73	.37	1.12	.66	.93	.10	.05	.63	.03	.95	3.34	9.91	100.00

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TABLE 18.—***INJURIES:*** *By kinds of mines and*

	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Copper.										
1917	**4,500**	**2,351**	**1,760**	**223**	**2,142**	**446**	**246**	**802**	**25**	**134**
1916	4,758	2,484	2,078	280	2,070	495	658	723	25	133
1915	3,329	1,902	1,289	124	1,493	374	300	962	26	307
1914	3,015	1,903	1,103	125	1,343	434	318	580	21	60
1913	3,216	1,014	1,589	124	1,499	555	479	511	12	135
1912	3,740	1,611	1,185	105	1,142	556	541	626	19	193
1911	3,273	.....	788	96	1,853	549	489	564	14	324
Gold and miscellaneous metal.										
1917	**1,123**	**679**	**548**	**108**	**615**	**308**	**141**	**502**	**25**	**192**
1916	2,017	1,089	729	146	929	346	138	695	28	57
1915	1,512	948	846	83	761	309	195	613	21	51
1914	1,225	472	528	72	609	223	146	416	4	64
1913	806	261	360	61	406	183	287	298	8	68
1912	893	244	394	64	409	158	246	251	5	56
1911	978	.....	269	90	326	119	275	258	4	71
Iron.										
1917	**1,846**	**1,413**	**1,202**	**107**	**1,586**	**209**	**165**	**455**	**26**	**64**
1916	2,053	1,304	1,260	322	1,645	155	178	509	33	68
1915	1,430	920	981	76	1,135	123	161	406	16	48
1914	1,532	877	1,002	85	1,110	142	179	373	20	53
1913	2,448	968	1,754	154	1,730	202	349	557	37	227
1912	2,036	791	1,206	193	1,485	188	238	591	12	102
1911	2,556	.....	964	147	1,154	192	203	443	11	227
Lead and Zinc (Mississippi valley).										
1917	**528**	**776**	**90**	**54**	**433**	**103**	**37**	**363**	**6**	**17**
1916	651	960	117	50	527	63	44	302	3	67
1915	323	640	83	44	308	37	25	169	6	41
1914	303	239	72	44	193	20	6	90	3	22
1913	206	285	77	22	134	6	3	112	.....	48
1912	209	453	60	26	228	37	16	124	2	109
1911	386	.....	36	34	157	45	12	121	4	49
Nonmetallic mineral.										
1917	**35**	**114**	**18**	**7**	**49**	**8**	**1**	**25**	**3**	**11**
1916	56	114	11	12	55	1	.....	24	.....	7
1915	29	66	11	15	35	4	1	7	.....	2
1914	29	62	25	8	48	4	.....	29	4	5
1913	38	56	15	15	65	1	.....	22	2	9
1912	16	35	11	11	47	2	.....	21	1	11
1911	63	.....	6	14	40	3	2	11	.....	11
Total U. S.										
1917	**8,032**	**5,333**	**3,618**	**499**	**4,825**	**1,074**	**590**	**2,147**	**85**	**418**
1916	9,535	5,951	4,195	810	5,226	1,060	1,018	2,253	89	332
1915	6,623	4,476	3,210	342	3,732	847	682	2,157	69	449
1914	6,104	3,553	2,730	334	3,303	823	649	1,488	52	204
1913	6,714	2,584	3,795	376	3,834	947	1,118	1,500	59	487
1912	6,984	3,134	2,856	399	3,311	941	1,041	1,613	39	471
1911	7,256	.....	2,063	381	3,530	908	981	1,397	33	682

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causes, during the years ended Dec. 31, 1911 to 1917.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
39	31	3	296	3,172	16,170	18	121	3	1	90	129	362
2	13	.....	237	2,391	16,347	41	89	.....	1	57	108	296
12	18	.....	227	1,880	12,243	26	97	1	.....	61	98	283
1	3	.....	108	1,779	10,793	16	71	.....	.....	90	69	246
9	5	3	120	1,394	10,665	35	99	2	3	74	60	273
6	3	1	130	1,630	11,488	63	110	.....	.....	79	38	290
7	8	.....	.....	682	8,647	23	56	5	3	.....	62	149
3	14	1	191	2,351	6,801	29	65	8	3	107	131	343
5	16	1	213	1,542	7,951	56	91	4	3	108	112	374
14	36	13	212	1,177	6,791	21	45	2	1	84	46	199
5	11	.....	36	704	4,515	15	39	9	1	43	34	141
1	10	1	36	412	3,198	18	35	2	2	42	28	127
6	14	1	26	413	3,180	15	46	3	2	38	27	131
7	4	9	.....	699	3,109	18	34	.....	13	.....	58	123
3	9	.....	198	1,313	8,596	22	49	4	2	96	103	276
.....	6	3	178	1,231	8,945	24	62	.....	2	112	101	301
1	11	.....	131	964	6,403	11	70	1	.....	80	66	228
.....	8	12	80	901	6,374	12	48	.....	2	86	63	211
1	6	13	142	1,015	9,603	38	85	5	3	87	43	261
.....	18	8	71	651	7,590	18	91	2	1	96	56	264
6	4	1	.....	1,721	7,629	40	77	.....	8	.....	90	215
.....	10	.....	118	858	3,393	16	214	2	2	81	69	384
14	3	.....	115	668	3,584	9	101	1	1	81	67	260
15	13	21	113	410	2,248	3	56	1	1	33	28	122
.....	.....	.....	8	375	1,375	7	24	.....	.....	39	30	100
1	.....	.....	17	167	1,078	6	26	.....	.....	14	17	63
.....	.....	.....	14	285	1,653	8	30	1	2	32	22	95
4	2	3	.....	310	1,163	11	88	2	2	.....	34	137
.....	.....	.....	11	144	426	.....	1	.....	.....	.....	3	4
.....	.....	.....	7	90	377	2	4	.....	.....	2	6	14
.....	4	.....	3	31	208	.....	3	.....	.....	1	.....	4
.....	.....	.....	2	24	240	.....	.....	.....	.....	2	.....	2
.....	.....	.....	3	22	248	3	4	.....	.....	2	.....	9
.....	.....	.....	.....	13	168	.....	1	.....	.....	.....	.....	1
.....	.....	1	.....	53	204	1	1	.....	.....	.....	.....	2
45	64	4	814	7,838	35,386	85	450	17	8	374	435	1,369
21	38	4	750	5,922	37,204	132	347	5	7	360	394	1,245
42	82	34	686	4,462	27,893	61	271	5	2	259	238	836
6	22	12	234	3,783	23,297	50	182	9	3	260	196	700
12	21	17	318	3,010	24,792	100	249	9	8	219	148	733
12	35	10	241	2,992	24,079	104	278	6	5	245	143	781
24	18	14	.....	3,465	20,752	93	256	7	26	.....	244	626

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TABLE 18.—*INJURIES: By kinds of mines and*

	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Copper.										
1917	145	62	45	207	79	303	8	139	1,061	2,049
1916	137	40	44	211	80	218	22	161	1,131	2,044
1915	62	29	34	134	67	190	5	134	789	1,444
1914	105	22	40	100	42	188	10	107	372	986
1913	74	27	30	87	25	181	8	123	349	904
1912	63	29	37	129	20	159	6	204	261	908
1911	33	16	62	.....	.....	.....	15	77	536	739
Gold, and miscellaneous metal.										
1917	75	21	19	105	96	131	19	123	437	1,026
1916	134	28	19	131	88	179	15	145	552	1,291
1915	81	15	21	114	67	132	33	116	342	921
1914	45	28	14	49	19	93	6	71	205	530
1913	34	3	8	33	11	52	4	78	84	307
1912	28	6	5	32	28	51	14	55	97	316
1911	43	5	10	.....	.....	.....	6	58	155	277
Iron.										
1917	136	70	28	190	114	254	17	143	745	1,697
1916	131	69	20	176	87	216	10	151	661	1,521
1915	54	27	17	113	51	175	5	93	413	948
1914	84	30	22	196	55	185	7	114	437	1,130
1913	46	44	12	221	65	408	10	164	457	1,427
1912	56	41	59	208	47	315	9	172	274	1,181
1911	91	29	35	.....	.....	.....	1	188	441	785
Lead and zinc (Mississippi Valley).										
1917	31	26	24	54	84	83	7	131	291	731
1916	34	25	30	102	96	93	6	98	376	860
1915	14	9	24	24	42	35	5	27	105	285
1914	14	7	11	16	15	39	2	24	146	274
1913	2	55	2	28	25	32	.....	45	81	270
1912	21	1	19	22	19	36	.....	37	74	229
1911	13	6	9	.....	.....	.....	1	53	85	167
Nonmetallic mineral.										
1917	24	44	7	37	47	48	4	41	250	502
1916	40	14	12	38	97	117	5	47	174	544
1915	7	7	6	27	39	44	1	24	120	275
1914	9	6	8	26	14	21	1	17	94	196
1913	10	.....	2	7	1	7	.....	8	7	42
1912	2	2	.....	2	9	1	.....	5	20	41
1911	5	1	.....	.....	.....	.....	.....	5	13	24
Total U. S.										
1917	411	223	123	593	420	819	55	577	2,784	6,005
1916	476	176	125	658	448	823	58	602	2,894	6,260
1915	218	87	102	412	266	576	49	394	1,769	3,873
1914	257	93	95	387	145	526	26	333	1,254	3,116
1913	166	129	54	376	127	680	22	418	978	2,950
1912	170	79	120	393	123	562	29	473	726	2,675
1911	185	57	116	.....	.....	.....	23	381	1,230	1,992

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causes during the years ended Dec. 31, 1911 to 1917—Continued.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		
304	24	117	67	147	8	4	37	1	84	561	1,354	19,935
316	8	111	36	46	2	1	27	3	79	852	1,481	20,168
343	23	113	52	124	3	2	35	2	76	511	1,284	15,254
303	84	162	52	146	1	1	60	4	92	437	1,342	13,367
361	93	134	67	181	1	3	49	3	112	517	1,521	13,363
244	66	104	104	99	30	.....	41	5	27	231	951	13,637
225	52	89	45	112	37	.....	171	4	.....	72	807	10,342
43	11	23	.....	10	.....	1	11	1	22	93	215	8,385
36	4	11	.....	84	.....	.....	137	2	110	234	618	10,234
45	7	2	.....	55	3	1	91	5	69	188	466	8,377
45	5	7	.....	32	.....	5	97	3	120	101	415	5,601
31	6	10	35	27	3	1	9	3	38	60	223	3,855
36	2	3	17	23	3	1	8	1	46	26	166	3,793
16	7	10	6	24	6	2	10	3	.....	25	109	3,618
206	65	269	233	143	3	16	51	1	211	511	1,709	12,278
145	40	200	144	93	3	10	26	4	123	349	1,137	11,904
126	13	94	42	67	3	6	8	.....	113	286	758	8,337
143	35	126	100	101	9	.....	19	.....	140	385	1,058	8,773
361	90	264	244	151	30	22	70	2	350	598	2,182	13,473
249	88	211	177	147	7	5	60	.....	242	286	1,472	10,507
258	80	351	193	206	34	10	108	4	.....	849	2,093	10,722
3	.....	17	.....	.....	.....	1	.....	.....	3	12	36	4,544
13	1	25	2	3	.....	3	1	.....	5	16	69	4,773
4	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	6	2,661
1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	1,751
8	2	1	1	1	.....	1	1	.....	2	8	25	1,436
2	.....	.....	3	1	5	2	.....	4	.....	2	19	1,996
2	1	2	.....	2	2	1	4	.....	.....	7	21	1,488
23	18	17	9	11	.....	2	9	1	19	103	212	1,144
31	7	30	4	21	.....	6	17	3	30	74	223	1,158
18	3	18	1	9	1	6	33	3	18	69	179	666
49	6	34	1	18	4	2	32	1	38	101	286	724
81	12	70	5	59	8	1	60	6	46	197	545	844
26	18	60	7	61	3	1	63	3	60	289	591	801
19	10	48	.....	3	.....	.....	59	1	.....	37	177	407
579	118	443	309	311	11	24	108	4	339	1,280	3,526	46 286
541	60	377	186	247	5	20	208	12	347	1,525	3,528	48,237
536	46	229	95	255	10	15	167	10	276	1,054	2,693	35,295
541	130	329	153	298	14	8	208	8	390	1,024	3,103	30,216
842	203	479	352	419	42	28	189	14	548	1,380	4,496	32,971
557	174	378	308	331	48	9	172	13	375	834	3,199	30,734
520	150	500	244	347	79	13	347	12	.....	995	3,207	26,577

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TABLE 19.—*ALL MINES: Percentages of fatalities and injuries, by causes and kinds of mines, during the year ended Dec. 31, 1917.*

Causes.	Percentage killed.							Percentage injured.						
	Copper.	Gold, silver, and miscellaneous metal.	Iron.	Lead and zinc (Mississippi Valley).	Non-metallic mineral.	Total. 1917.	Total. 1916.	Copper.	Gold, silver, and miscellaneous metal.	Iron.	Lead and zinc (Mississippi Valley).	Non-metallic mineral.	Total. 1917.	Total. 1916.
Underground:														
1. Fall of rock or ore from roof or wall	20.05	21.43	31.41	33.82	26.08	**24.18**	31.13	22.57	13.39	15.04	11.62	3.06	**17.35**	19.77
2. Rock or ore while loading at working face or chute	1.60	1.02	2.10	4.41	.....	**1.76**	1.43	11.79	8.10	11.51	17.08	9.97	**11.52**	12.34
3. Timber or hand tools	.27	.51	.....	.....	.....	**.23**	.29	8.83	6.54	9.79	1.98	1.57	**7.82**	8.70
4. Explosives	5.08	14.29	3.67	22.06	.....	**8.10**	10.62	1.12	1.29	.87	1.19	.61	**1.08**	1.68
5. Haulage system (mine cars, mine locomotives, breakage of rope, etc.)	3.48	2.04	8.38	4.41	.....	**4.23**	4.74	10.74	7.33	12.92	9.53	4.28	**10.42**	10.83
6. Falling down chute, winze, raise, or stope	4.01	13.26	6.81	2.94	.....	**6.57**	5.74	2.24	3.67	1.70	2.27	.70	**2.32**	2.20
7. Run of ore from chute or pocket	.53	1.53	1.05	.....	.....	**.82**	1.58	1.23	1.68	1.34	.81	.09	**1.28**	2.11
8. Drilling accidents (by machine or hand drills)	.....	.....	.52	.....	4.35	**.23**	.....	4.02	5.99	3.71	7.99	2.19	**4.64**	4.67
9. Electricity	.80	3.06	.52	1.47	.....	**1.29**	2.44	.13	.30	.21	.13	.26	**.18**	.18
10. Machinery (other than locomotives or drills)	.....	.51	.52	.....	4.35	**.35**	.29	.67	2.29	.52	.37	.96	**.90**	.69
11. Mine fires	43.85	.51	.....	.....	.....	**19.37**	3.87	.20	.03	.03	.....	.....	**.10**	.04
12. Suffocation from natural gases	.80	.....	.52	2.94	.....	**.70**	.86	.16	.17	.07	.22	.....	**.14**	.08
13. Inrush of water	.53	1.02	.....	.....	.....	**.47**	.14	.02	.01	.....	.....	.....	**.01**	.01
14. Nails, splinters, etc	.....	.....	.....	.....	.....	.....	.29	1.48	2.28	1.61	2.60	.96	**1.76**	1.55
15. Other causes	3.21	3.57	.52	2.94	4.35	**2.70**	3.30	15.91	28.04	10.69	18.88	12.59	**16.93**	12.28
Total underground	**84.22**	**62.76**	**56.02**	**75.00**	**39.13**	**71.01**	**66.72**	**81.11**	**81.11**	**70.01**	**74.67**	**37.24**	**76.45**	**77.13**
Shaft:														
16. Falling down shafts	2.41	5.10	7.86	10.30	.....	**4.81**	6.46	.09	.35	.18	.35	.....	**.18**	.27
17. Objects falling down shafts	1.60	5.10	1.05	4.41	.....	**2.47**	2.58	.60	.78	.40	4.71	.09	**.97**	.72
18. Breaking of cables	.....	1.02	.52	1.47	.....	**.47**	.29	.02	.09	.03	.04	.....	**.04**	.01
19. Overwinding	.27	1.02	.....	.....	.....	**.35**	.29	.01	.03	.02	.04	.....	**.02**	.01
20. Skip, cage, or bucket	4.01	8.16	4.71	1.47	.....	**4.81**	4.73	.45	1.28	.78	1.78	.....	**.81**	.75
21. Other causes	1.60	1.53	.52	2.94	.....	**1.41**	1.29	.65	1.56	.84	1.52	.26	**.94**	.82
Total shaft	**9.89**	**21.94**	**14.66**	**20.59**	.....	**14.32**	**15.64**	**1.82**	**4.09**	**2.25**	**8.45**	**.35**	**2.96**	**2.58**

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Surface (at surface yards and shops):														
22. Mine cars or mine locomotives, gravity or aerial trams	1.07	.....	1.57	.....	.....	.82	1.29	.73	.89	1.11	.68	2.10	.89	.99
23. Railway cars and locomotives	.80	.....	1.05	.....	8.69	.82	.72	.31	.25	.57	.57	3.85	.48	.36
24. Run or fall of ore in or from ore bins	.....	.....	.....	.....	.....	.....	.29	.22	.23	.23	.53	.61	.26	.26
25. Falls of persons	.....	4.08	1.05	1.47	8.69	1.53	2.15	1.04	1.25	1.54	1.19	3.23	1.23	1.36
26. Nails, splinters, etc	.....	.....	.....	.....	.....	.....	.14	.40	1.15	.93	1.85	4.11	.91	.93
27. Hand tools, axes, bars, etc	.....	.....	.....	.....	.....	.....	.14	1.52	1.56	2.07	1.83	4.20	1.77	1.71
28. Electricity	.....	2.04	.....	1.47	4.35	.70	1.01	.04	.23	.14	.15	.35	.12	.12
29. Machinery	.27	1.02	1.05	.....	4.35	.70	1.72	.70	1.47	1.16	2.88	3.58	1.25	1.25
30. Other causes	.27	6.12	5.76	1.47	4.35	3.05	3.44	5.32	5.21	6.07	6.41	21.85	6.01	6.00
Total surface	2.41	13.26	10.47	4.41	30.43	7.63	10.90	10.28	12.24	13.82	16.09	43.88	12.97	12.98
Open pit:														
31. Falls or slides of rock or ore	1.07	.....	5.76	.....	8.69	2.00	1.15	1.52	.51	1.68	.07	2.01	1.25	1.12
32. Explosives	.27	.51	4.19	.....	.....	1.18	2.15	.12	.13	.53	.....	1.57	.26	.13
33. Haulage system (cars, locomotives, etc.)	2.14	.51	6.81	.....	4.35	2.70	1.87	.59	.28	2.19	.37	1.49	.96	.78
34. Steam shovels	.....	.....	1.05	.....	.....	.23	.14	.34	.....	1.89	.....	.79	.67	.39
35. Falls of persons	.....	.51	.52	.....	.....	.23	.29	.74	.12	1.16	.....	.96	.67	.51
36. Falls of derricks, booms, etc	.....	.....	.....	.....	.....	.....	.14	.04	.....	.03	.....	.....	.02	.01
37. Run or fall of ore in or from ore bins	.....	.....	.....	.....	.....	.....	.....	.02	.01	.13	.02	.17	.05	.04
38. Machinery (other than locomotives or steam shovels)	.....	.....	.52	.....	.....	.12	.14	.18	.13	.42	.....	.79	.23	.43
39. Electricity	.....	.....	.....	.....	8.69	.23	.29	.01	.01	.01	.....	.09	.01	.02
40. Hand tools	.....	.....	.....	.....	.....	.....	.....	.42	.26	1.72	.07	1.66	.73	.72
41. Other causes	.....	.51	.....	.....	8.69	.35	.57	2.81	1.11	4.16	.26	9.00	2.77	3.16
Total open pit	3.48	2.04	18.85	.....	30.43	7.04	6.74	6.79	2.56	13.92	.79	18.53	7.62	7.31
Grand total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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ACCIDENT STATISTICS, BY STATES.

A compilation of the accident statistics, by States, is given in Tables 3, 4, and 5 representing 4,637 operators employing 200,579 men in 1917. Tables 29 to 36, inclusive, give summary data, by States and years, relating to labor, accidents, etc., for the 7-year period 1911 to 1917, inclusive.

CAUSES AND DISTRIBUTION OF ACCIDENTS.

Tables 16, 17, and 18 show the number of deaths and injuries from any one cause in each group of mines, and for all the mines combined. Table 19 shows the percentage of fatalities and injuries due to any one cause for the year 1917, while at the bottom of Table 17 is given a similar percentage for the 7-year period, 1911 to 1917, for the United States as a unit.

ACCIDENT AND INJURY RATES COMPARED ON A 300-DAY BASIS, 1911 TO 1917.

The customary basis for computing fatality rates is the number of men employed in the industry. This basis is faulty in that under existing conditions the exact number of men actually "at work" can not be obtained because all the men do not work full time. In every mining district there are men who work a few days at one mine and either quit or are discharged, and go to another mine. The actual number of men on the pay roll of any mine is, therefore, much larger than the number of men at work, and unfortunately it is too often the total number of names on the pay roll that is reported in lieu of the pay roll shifts.

In comparing mine accidents, the time element must be taken into consideration. In other words, the length of time the man is exposed to the mining risk should be an important factor in arriving at the true hazard of the mining industry. The reports rendered by the individual mining companies usually show the average number of men employed and also the number of days the mine was operated during the year. The number of days in operation varies from perhaps 50 to a maximum of 360 days. These working periods for each individual mine are used in connection with the average number of men employed, thus giving a reasonably close approximation of the total number of days' work performed during the year. As regards some of the larger companies the actual number of pay roll shifts is reported. With the total number of days of labor as a basis a true comparison of mining accidents can be made, one State with another, or one year with another. As a mine can be worked only about 300 days in a year, if Sundays and holidays and a few days for repairs be excluded, this figure is used as a basis for calculating the number of full-time workers, simply dividing the total shifts by 300, thus mak-

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ing it possible to reduce all rates to a common base of 1,000 300-day workers. The rates for previous years from 1911 to and including 1916 have been recast to the 300-day basis as shown in Tables 30 to 37. The reader will, therefore, bear in mind that unless otherwise stated, all rates in this report are on the basis of 1,000 300-day (full-time) workers.

ACCIDENTS CLASSIFIED BY MINING METHODS.

In the bureau's report[a] for 1914 data relating to mine accidents were classified by mining methods for the first time. Similar data for 1915, 1916, and 1917 have been collected, thus placing the results of four year's work on a camparative basis.

Data on the classification of accidents according to systems of mining are essential for ascertaining the risk in the different mining methods. The bureau's accident-report cards, sent to the operators during the past four years, requested that the method of mining be reported with the statistics of accidents. With these reports as a basis, the bureau was able to select the returns from 258 mining companies in 1914, 280 in 1915, 246 in 1916, and 276 in 1917, representing approximately 75 per cent of the metal-mining industry, whose records appear reasonably complete. Reports from companies whose data were not reasonably complete in all details were omitted in this study. Shop, yard, and other surface employees, as well as their accidents were omitted. The figures given herein, therefore, include the actual number of men employed underground and in open-pit mines (excluding yard and shop men), with the corresponding number of accidents for each group. (See Table 20.)

[a] Fay, A. H., Metal-mine accidents in the United States during the calendar year 1914: Bureau of Mines, 1915, 96 pp.

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TABLE 20.—*Summary of metal-mine accident data grouped by methods of mining during the year ended Dec. 31, 1917.*

Method of mining.	Number companies represented.	Number States represented.	Days active.	Total days labor.	Number men employed in mines.	Number 300-day workers.	Number killed.			Number injured.		
							Total.	Per 1,000 employed.	Per 1,000 300-day workers.	Total.	Per 1,000 employed.	Per 1,000 300-day workers.
1. Room and pillar	57	16	292	3,047,739	10,440	10,159	61	5.84	6.00	2,953	282.85	290.68
2. Overhand stoping:												
(*a*) With stulls	20	8	332	1,185,751	3,572	3,953	11	3.08	2.78	1,180	330.35	298.51
(*b*) With square sets, cribs, etc	31	6	310	7,025,055	22,643	23,417	78	3.44	3.33	8,571	378.53	366.02
(*c*) With filling	27	10	328	1,881,398	5,732	6,271	27	4.71	4.31	2,187	381.54	348.75
(*d*) Shrinkage	19	10	311	849,980	2,731	2,833	18	6.59	6.35	1,128	413.04	398.16
3. Underhand stoping	8	7	311	1,389,376	4,473	4,631	19	4.25	4.10	1,380	308.52	297.99
4. Caving methods	69	6	292	5,952,993	20,390	19,843	85	4.17	4.28	6,545	320.99	329.84
5. Open pit, with steam shovel	32	8	299	3,098,854	10,348	10,330	29	2.80	2.81	2,287	221.01	221.39
6. Open pit, without steam shovel	13	9	294	377,026	1,282	1,257	0	.....	.....	109	85.02	86.71
Total, 1917	**276**	.....	**304**	**24,808,172**	**81,611**	**82,694**	**328**	**4.02**	**3.97**	**26,340**	**322.75**	**318.52**
Total, 1916	246	.....	307	21,496,327	69,997	71,653	291	4.16	4.06	28,576	408.23	398.82
Total, 1915	280	.....	303	22,842,999	75,365	76,140	324	4.29	4.25	27,314	362.42	358.73
Total, 1914	258	.....	292	22,004,824	75,453	73,349	361	4.78	4.92	24,306	322.13	331.38

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TABLE 21.—***FATALITIES,*** *classified by principal causes and mining methods, during the years ended Dec. 31, 1916 and 1917.*

Method of mining.	Number killed.																					
	By falls of rock. 1 and 31.			By run or fall of ore while loading at chute, bin, or working face. 2, 7, and 37.			By explosives. 4 and 32.			By haulage. 5 and 33.			By falls of persons. 6 and 35.			Miscellaneous. 3, 8, 9, 10, 11, 12, 13, 14, 15, 34, 36, 38, 39, 40, and 41.			In shaft. 16, 17, 18, 19, 20, and 21.			Total.	
	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Rate per 1,000 300-day workers.
1917.																						
Room and pillar	33	54.10	3.25	1	1.64	0.10	7	11.47	0.69	6	9.84	0.59	2	3.28	0.19	2	3.28	0.19	10	16.39	0.98	**61**	6.00
Overhand stoping:																						
(*a*) With stulls	5	45.46	1.27	.....	.....	.....	1	9.09	.25	1	9.09	.25	1	9.09	.25	.....	.....	.....	3	27.27	.76	**11**	2.78
(*b*) With square sets, cribs, etc	28	35.90	1.20	3	3.85	.13	12	15.39	.51	2	2.56	.08	5	6.41	.21	7	8.97	.30	21	26.92	.90	**78**	3.33
(*c*) With filling	11	40.74	1.75	.....	.....	.....	.....	.....	.....	1	3.70	.16	4	14.82	.64	6	22.22	.96	5	18.52	.80	**27**	4.31
(*d*) Shrinkage	4	22.22	1.41	2	11.11	.71	2	11.11	.71	.....	.....	.....	2	11.11	.71	4	22.22	1.41	4	22.22	1.41	**18**	6.35
Underhand stoping	13	68.42	2.81	.....	.....	.....	1	5.26	.21	3	15.79	.65	.....	.....	.....	.....	.....	.....	2	10.53	.43	**19**	4.10
Caving methods	36	42.35	1.81	3	3.53	.15	6	7.06	.30	13	15.30	.66	8	9.41	.40	3	3.53	.15	16	18.82	.81	**85**	4.28
Open pit, with steam shovel	9	31.04	.87	.....	.....	.....	4	13.79	.39	13	44.83	1.26	.....	.....	.....	3	10.34	.29	.....	.....	.....	**29**	2.81
Open pit, without steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1917	**139**	**42.38**	**1.68**	**9**	**2.74**	**.11**	**33**	**10.06**	**.40**	**39**	**11.89**	**.47**	**22**	**6.71**	**.27**	**25**	**7.62**	**.30**	**61**	**18.60**	**.74**	**328**	**3.97**

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1916.																						
Room and pillar	21	44.68	2.50	.....	.....	.....	9	19.15	1.07	7	14.90	0.83	2	4.25	0.24	2	4.25	0.24	6	12.77	0.71	47	5.59
Overhand stoping:																							
(a) With stulls	4	19.05	.87	2	9.52	0.43	1	4.76	.22	1	4.76	.22	2	9.52	.43	4	19.05	.87	7	33.34	1.51	21	4.55
(b) With square sets, cribs, etc	25	45.45	1.60	1	1.82	.06	3	5.45	.19	3	5.45	.19	2	3.64	.13	8	14.55	.51	13	23.64	.83	55	3.51
(c) With filling	13	37.15	1.92	2	5.71	.30	2	5.71	.30	2	5.71	.30	1	2.86	.14	4	11.43	.59	11	31.43	1.62	35	5.17
(d) Shrinkage	9	64.28	2.82	.....	.....	.....	4	28.57	1.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	7.15	.31	14	4.38
Underhand stoping	3	25.00	.81	1	8.33	.27	3	25.00	.81	2	16.67	.53	1	8.33	.27	1	8.33	.27	1	8.33	.27	12	3.23
Caving methods	34	42.50	1.66	3	3.75	.15	13	16.25	.64	8	10.00	.39	7	8.75	.34	2	2.50	.10	13	16.25	.64	80	3.92
Open pit, with steam shovel	5	18.52	.58	.....	.....	.....	7	25.93	.82	11	40.74	1.28	.....	.....	.....	4	14.81	.47	.....	.....	.....	27	3.15
Open pit, without steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1916	**114**	**39.18**	**1.59**	**9**	**3.09**	**.12**	**42**	**14.43**	**.59**	**34**	**11.68**	**.47**	**15**	**5.16**	**.21**	**25**	**8.59**	**.35**	**52**	**17.87**	**.73**	**291**	**4.06**

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TABLE 22.—***INJURIES,*** *classified by principal causes and mining methods, during the years ended Dec. 31, 1916 and 1917.*

Method of mining.	Number injured.																						
	By falls of rock.			By run or fall of ore while loading at chute, bin, or working face.			By explosives.			By haulage.			By falls of persons.			Miscellaneous.			In shaft.			Total.	
	1 and 31.			2, 7, and 37.			4 and 32.			5 and 33.			6 and 35.			3, 8, 9, 10, 11, 12, 13, 14, 15, 34, 36, 38, 39, 40, and 41.			16, 17, 18, 19, 20, and 21.				
	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Rate per 1,000 300-day workers.
1917.																							
Room and pillar	402	13.61	39.57	734	24.86	72.25	31	1.05	3.05	707	23.94	69.60	88	2.98	8.66	858	29.06	84.46	133	4.50	13.09	**2,953**	290.68
Overhand stoping:																							
(*a*) With stulls	499	42.29	126.23	74	6.27	18.72	6	.51	1.52	134	11.36	33.90	41	3.47	10.37	403	34.15	101.95	23	1.95	5.82	**1,180**	298.51
(*b*) With square sets, cribs, etc	2,166	25.27	92.50	1,608	18.76	68.67	99	1.55	4.23	1,263	14.74	53.94	234	2.73	9.99	3,003	35.04	128.24	198	2.31	8.45	**8,571**	366.02
(*c*) With filling	577	26.38	92.01	276	12.62	44.01	36	1.64	5.74	253	11.57	40.35	50	2.29	7.97	887	40.56	141.45	108	4.94	17.22	**2,187**	348.75
(*d*) Shrinkage	128	11.35	45.18	367	32.54	129.54	20	1.77	7.06	148	13.12	52.24	22	1.95	7.77	395	35.02	139.43	48	4.25	16.94	**1,128**	398.16
Underhand stoping	77	5.58	16.63	402	29.13	86.81	9	.65	1.94	395	28.63	85.29	21	1.52	4.53	475	34.42	102.57	1	.07	.22	**1,380**	297.99
Caving methods	1,841	28.13	92.78	745	11.38	37.55	100	1.53	5.04	840	12.83	42.33	146	2.23	7.36	2,711	41.42	136.62	162	2.48	8.16	**6,545**	329.84
Open pit, with steam shovel	380	16.62	36.79	17	.74	1.64	75	3.28	7.26	304	13.29	29.43	223	9.75	21.59	1,288	56.32	124.68	.....	.....	.....	**2,287**	221.39
Open pit, without steam shovel	24	22.02	19.09	.....	.....	.....	16	14.68	12.73	21	19.27	16.71	2	1.83	1.59	46	42.20	36.59	.....	.....	.....	**109**	86.71
Total, 1917	**6,094**	**23.14**	**73.69**	**4,223**	**16.03**	**51.06**	**392**	**1.49**	**4.74**	**4,065**	**15.43**	**49.17**	**827**	**3.14**	**10.00**	**10,066**	**38.22**	**121.72**	**673**	**2.55**	**8.14**	**26,340**	**318.52**

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1916.																						
Room and pillar	591	14.73	70.27	998	24.87	118.67	58	1.45	6.90	793	19.76	94.29	68	1.69	8.09	1,273	31.72	151.37	232	5.78	27.58	**4,013**	477.17
Overhand stoping:																							
(*a*) With stulls	430	23.57	93.07	290	15.90	62.77	20	1.10	4.33	186	10.20	40.26	66	3.62	14.29	779	42.71	168.62	53	2.90	11.47	**1,824**	394.81
(*b*) With square sets, cribs, etc	2,191	28.60	140.00	1,502	19.61	95.97	142	1.85	9.07	985	12.86	62.94	166	2.17	10.61	2,471	32.25	157.89	204	2.66	13.04	**7,661**	489.52
(*c*) With filling	668	25.85	98.67	546	21.13	80.65	22	.85	3.25	300	11.61	44.31	100	3.87	14.77	880	34.06	129.99	68	2.63	10.04	**2,584**	381.68
(*d*) Shrinkage	142	12.58	44.38	379	33.57	118.44	20	1.77	6.25	133	11.78	41.56	22	1.95	6.87	395	34.99	123.44	38	3.36	11.87	**1,129**	352.81
Underhand stoping	95	5.56	25.61	524	30.70	141.24	217	12.71	58.49	365	21.38	98.38	24	1.41	6.47	459	26.89	123.72	23	1.35	6.20	**1,707**	460.11
Caving methods	1,962	27.50	96.18	889	12.46	43.58	173	2.42	8.48	978	13.71	47.94	124	1.74	6.08	2,795	39.18	137.01	213	2.99	10.44	**7,134**	349.71
Open pit, with steam shovel	402	16.64	46.85	9	.37	1.05	41	1.70	4.78	287	11.88	33.45	129	5.34	15.03	1,548	64.07	180.42	.....	.....	.....	**2,416**	281.58
Open pit, without steam shovel	26	24.07	83.87	3	2.78	9.68	5	4.63	16.13	34	31.48	109.68	2	1.85	6.45	38	35.19	122.58	.....	.....	.....	**108**	348.39
Total, 1916	**6,507**	**22.77**	**90.82**	**5,140**	**17.99**	**71.74**	**698**	**2.44**	**9.74**	**4,061**	**14.21**	**56.68**	**701**	**2.45**	**9.78**	**10,638**	**37.23**	**148.47**	**831**	**2.91**	**11.60**	**28,576**	**398.82**

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TABLE 23.—*METAL-MINE ACCIDENTS in 1917,*

NUMBER KILLED.

Method of mining.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Room and pillar	33	1	.....	7	6	2	.....	.....	.....	.....
Overhand stoping:										
(*a*) With stulls	5	.....	.....	1	1	1	.....	.....	.....	.....
(*b*) With square sets, cribs, etc.	28	3	.....	12	2	5	.....	.....	.....	.....
(*c*) With filling	11	.....	1	.....	1	4	.....	.....	1	.....
(*d*) Shrinkage	4	2	.....	2	.....	2	.....	1	2	.....
Underhand stoping	13	.....	.....	1	3	.....	.....	.....	.....	.....
Caving methods	36	2	.....	6	13	8	1	.....	1	1
Open pit, with steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Open pit, without steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1917	**130**	**8**	**1**	**29**	**26**	**22**	**1**	**1**	**4**	**1**
Total, 1916	109	6	1	35	23	15	3	.....	6	1
Total, 1915	147	6	5	32	12	30	9	.....	10	.....
Total, 1914	141	4	2	32	25	33	2	1	6	1

NUMBER INJURED.

Room and pillar	402	673	127	31	707	88	61	240	7	10
Overhand stoping:										
(*a*) With stulls	499	73	138	6	134	41	1	110	7	1
(*b*) With square sets, cribs, etc.	2,166	1,524	971	99	1,263	234	84	390	9	14
(*c*) With filling	577	177	244	36	253	50	99	119	4	21
(*d*) Shrinkage	128	345	39	20	148	22	22	110	3	10
Underhand stoping	77	400	134	9	395	21	2	140	2	13
Caving methods	1,841	603	1,007	100	840	146	142	233	21	45
Open pit, with steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Open pit, without steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1917	**5,690**	**3,795**	**2,660**	**301**	**3,740**	**602**	**411**	**1,342**	**53**	**114**
Total, 1916	6,079	4,385	2,668	652	3,740	570	743	1,648	84	150
Total, 1915	5,912	3,788	2,965	262	3,323	696	614	1,851	66	427
Total, 1914	5,570	3,251	2,579	274	3,043	753	593	1,330	43	161

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by causes, grouped by mining methods.

NUMBER KILLED.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	**Total, underground.**	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	**Total, shaft.**
11	12	13	14	15		16	17	18	19	20	21	
.....	.....	.....	.....	2	**51**	4	2	.....	.....	3	1	**10**
.....	.....	.....	.....	.....	**8**	.....	.....	.....	.....	3	.....	**3**
3	.....	2	.....	2	**57**	3	3	.....	1	10	4	**21**
.....	.....	.....	.....	4	**22**	.....	2	.....	.....	2	1	**5**
.....	.....	.....	.....	1	**14**	.....	2	.....	.....	1	1	**4**
.....	.....	.....	.....	.....	**17**	2	.....	.....	.....	.....	.....	**2**
.....	1	.....	.....	.....	**69**	8	2	1	.....	4	1	**16**
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	1	2	.....	9	**238**	17	11	1	1	23	8	**61**
4	1	.....	.....	8	**212**	21	10	.....	.....	18	3	**52**
.....	1	.....	1	3	**256**	12	8	2	1	12	6	**41**
2	.....	8	.....	4	**261**	22	7	.....	.....	33	9	**71**

NUMBER INJURED.

.....	8	.....	74	392	**2,820**	5	47	1	1	51	28	**133**
.....	.....	.....	22	125	**1,157**	2	3	.....	.....	11	7	**23**
2	.....	.....	126	1,491	**8,373**	7	86	1	.....	55	49	**198**
32	.....	.....	51	416	**2,079**	2	47	.....	1	26	32	**108**
.....	.....	.....	20	213	**1,080**	1	5	.....	.....	14	28	**48**
.....	.....	.....	10	176	**1,379**	.....	.....	.....	.....	1	.....	**1**
2	13	2	162	1,226	**6,383**	12	26	3	1	54	66	**162**
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36	**21**	**2**	**465**	**4,039**	**23,271**	**29**	**214**	**5**	**3**	**212**	**210**	**673**
16	22	2	453	4,009	**25,221**	63	238	4	1	240	285	**831**
40	71	28	622	3,945	**24,610**	31	235	3	1	185	199	**654**
6	15	12	215	3,423	**21,268**	34	149	3	2	218	165	**571**

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TABLE 23.—*METAL-MINE ACCIDENTS in 1917.*

NUMBER KILLED.

Method of mining.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Room and pillar										
Overhand stoping:										
(*a*) With stulls										
(*b*) With square sets, cribs, etc										
(*c*) With filling										
(*d*) Shrinkage										
Underhand stoping										
Caving methods										
Open pit, with steam shovel										
Open pit, without steam shovel										
Total, 1917										
Total, 1916										
Total, 1915										
Total, 1914										

NUMBER INJURED.

Room and pillar										
Overhand stoping:										
(*a*) With stulls										
(*b*) With square sets, cribs, etc										
(*c*) With filling										
(*d*) Shrinkage										
Underhand stoping										
Caving methods										
Open pit, with steam shovel										
Open pit, without steam shovel										
Total, 1917										
Total, 1916										
Total, 1915										
Total, 1914										

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by causes, grouped by mining methods—Continued.

NUMBER KILLED.

Open pit.												Grand total.			
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.				
31	32	33	34	35	36	37	38	39	40	41		1917	1916	1915	1914
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	47	27	48
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	21	10	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	55	47	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27	35	99	181
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	14	36	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	12	11	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	80	67	103
9	4	13	2	.....	.....	.....	1	.....	.....	.....	29	29	27	24	24
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0	3	5
9	4	13	2	.....	.....	.....	1	.....	.....	.....	29	328	.....	.....	.....
5	7	11	.....	.....	.....	.....	.....	1	.....	3	27	.....	291	.....	.....
5	1	16	1	1	1	.....	.....	.....	.....	2	27	.....	.....	324	.....
9	8	9	1	.....	.....	.....	2	.....	.....	.....	29	.....	.....	.....	361

NUMBER INJURED.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,953	4,013	2,819	3,171
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,180	1,824	1,290	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,571	7,661	4,480	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,187	2,584	7,654	12,372
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,128	1,129	2,244	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,380	1,707	976	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,545	7,134	5,801	6,296
380	75	304	262	223	10	17	60	1	203	752	2,287	2,287	2,416	1,908	2,297
24	16	21	.....	2	.....	.....	2	.....	13	31	109	109	108	142	170
404	91	325	262	225	10	17	62	1	216	783	2,396	26,340	.....	.....	.....
428	46	321	169	131	3	12	52	6	187	1,169	2,524	.....	28,576	.....	.....
465	39	216	85	188	9	9	67	3	188	781	2,050	.....	.....	27,314	.....
484	112	299	146	249	4	3	79	4	258	829	2,467	.....	.....	.....	24,306

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Various methods of mining have been developed to work different types of ore bodies, and it is necessary to modify these methods to meet the requirements of each ore body if the ore is to be extracted at minimum cost and with least loss. Safety should be the first consideration, although many other factors have to be taken into account in laying out a mine. For the purpose of studying the mining hazard on the basis of mining methods, the returns received from the operators have been divided into six groups, as follows:

Operators' reports grouped by mining methods.

	Number of operators.		
	1915	1916	1917
1. Room and pillar	52	62	57
2. Overhand stoping:			
(*a*) With stulls	17	22	20
(*b*) With square sets, cribs, etc	31	32	31
(*c*) With filling	62	21	27
(*d*) Shrinkage	28	13	19
3. Underhand stoping	5	5	8
4. Caving methods	50	61	69
5. Open pit, with steam shovel	23	23	32
6. Open pit, without steam shovel	12	7	13
Total	280	246	276

ROOM-AND-PILLAR SYSTEM.

The data tabulated herein represent the returns from 57 operators in 16 different States, employing 10,440 men. The room-and-pillar system of mining is used largely in flat deposits, as, for example, the lead deposits of southeastern Missouri and the sheet-ground of Joplin. It is also applied in certain bedded iron-ore deposits.

Number killed and injured in mines using ***room-and-pillar*** *method of mining during the calendar years 1914 to 1917.*

Cause.	Killed.				Injured.			
	1914	1915	1916	1917	1914	1915	1916	1917
Falls of rock	22	17	21	33	465	401	591	402
Run of ore in stope, chute, or bin	1	.....	.....	1	726	746	998	734
Explosives	8	7	9	7	70	45	58	31
Haulage	8	.....	7	6	718	429	793	707
Falls of persons	2	1	2	2	54	29	68	88
Miscellaneous	4	.....	2	2	1,057	1,045	1,273	858
Shaft	3	2	6	10	81	124	232	133
Total	48	27	47	61	3,171	2,819	4,013	2,953
Per 1,000 300-day workers	5.73	3.97	5.59	6.00	378.63	413.95	477.17	290.68

OVERHAND STOPING.

Overhand stoping is more largely used than any other underground method of mining. This method has many variations, as

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indicated in Table 20, where the accident data tabulated represent 20 properties in which stulls were used, 31 with square sets and cribs, 27 with filling, and 19 with shrinkage. The following table gives the combined figures for the four subdivisions under overhand stoping.

Number killed and injured in mines where ***overhand stoping*** *is principal method used during the calendar years 1914 to 1917.*

Cause.	Killed.				Injured.			
	1914	1915	1916	1917	1914	1915	1916	1917
Fall of rock	77	89	51	48	3,060	3,579	3,431	3,370
Run of ore in stope, chute, or bin	3	10	5	5	2,520	2,922	2,717	2,325
Explosives	17	16	10	15	125	134	204	161
Haulage	8	9	6	4	1,544	1,771	1,604	1,798
Falls of persons	25	21	5	12	556	519	354	347
Miscellaneous	8	13	16	17	4,277	6,391	4,525	4,688
Shaft	43	35	32	33	290	352	363	377
Total	181	193	125	134	12,372	15,668	13,198	13,066
Per 1,000 300-day workers	5.11	4.71	4.13	3.67	345.91	382.72	436.44	358.23

UNDERHAND STOPING.

The accompanying table gives separate data on underhand stoping including returns from 8 operators, employing 4,473 men.

Number killed and injured in mines where ***underhand stoping*** *is principal method used during the calendar years 1914 to 1917.*

Cause.	Killed.				Injured.			
	1914 [a]	1915	1916	1917	1914	1915	1916	1917
Falls of rock	.....	7	3	13	.....	53	95	77
Run of ore in stope, chute, or bin	.....	1	1	.....	.....	248	524	402
Explosives	.....	1	3	1	.....	17	217	9
Haulage	.....	1	2	3	.....	329	365	395
Falls of persons	.....	.....	1	.....	.....	6	24	21
Miscellaneous	.....	.....	1	.....	.....	312	459	475
Shaft	.....	1	1	2	.....	11	23	1
Total	.....	11	12	19	.....	976	1,707	1,380
Per 1,000 300-day workers	.....	5.72	3.23	4.10	.....	507.80	460.11	297.99

[a] No data available.

CAVING SYSTEMS.

Data relating to caving systems of mining represent the returns of 69 operators in six different States, employing 20,390 men, and include largely the iron mines of Minnesota and Michigan and a number of copper mines in Arizona, California, and Utah. Many different names are applied to caving systems, but the principle is similar for all. The methods comprised in this classification are top slicing, substoping, block caving, pillar caving, etc., and the preliminary work that is absolutely necessary for any caving system.

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Number killed and injured in mines using the ***caving*** *system of mining during the calendar years 1914 to 1917.*

Cause.	Killed.				Injured.			
	1914	1915	1916	1917	1914	1915	1916	1917
Falls of rock	42	34	34	36	2,045	1,879	1,962	1,841
Run of ore in stope, chute, or bin	2	4	3	3	598	486	889	745
Explosives	7	8	13	6	79	66	173	100
Haulage	9	2	8	13	781	794	978	840
Falls of persons	6	8	7	8	143	142	124	146
Miscellaneous	12	7	2	3	2,450	2,267	2,795	2,711
Shaft	25	4	13	16	200	167	213	162
Total	103	67	80	85	6,296	5,801	7,134	6,545
Per 1,000 300-day workers	5.41	3.79	3.92	4.28	330.44	328.13	349.71	329.84

OPEN-PIT MINING WITH STEAM SHOVEL.

The returns from mines that used the open-pit method of mining with steam shovels represent 32 companies employing 10,348 men. These mines represent the large open-pit iron mines of Minnesota and Alabama and the copper mines in Nevada, New Mexico, and Utah. The accompanying table shows the fatalities and injuries by principal causes from 1914 to 1917, inclusive.

Number killed and injured in ***open-pit*** *mines where the ore is mined by steam shovel during the calendar years 1914 to 1917.*

Cause.	Killed.				Injured.			
	1914	1915	1916	1917	1914	1915	1916	1917
Falls of rock	5	4	5	9	425	449	402	380
Run of ore in stope, chute, or bin	.....	.....	.....	.....	.....	8	9	17
Explosives	8	1	7	4	107	38	41	75
Haulage	8	16	11	13	271	194	287	304
Falls of persons	.....	.....	.....	.....	238	179	129	223
Miscellaneous	3	3	4	3	1,256	1,040	1,548	1,288
Shaft	.....	.....	.....	.....	.....	.....	.....	.....
Total	24	24	27	29	2,297	1,908	2,416	2,287
Per 1,000 300-day workers	2.73	3.16	3.15	2.81	261.00	250.79	281.58	221.39

OPEN-PIT MINING WITHOUT STEAM SHOVEL.

The data compiled represent the returns of 13 operators employing 1,282 men. The accident rate with this system of mining is considerably lower than in any other, largely because of the lack of machinery and also the advantages of daylight in all of the operations. This method is comparable with quarrying, so far as hazards are concerned.

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*Number killed and injured in **open-pit** mines where no steam shovels are used during the calendar years 1914 to 1917.*

Cause.	Killed.				Injured.			
	1914	1915	1916	1917	1914	1915	1916	1917
Falls of rock	4	1	.....	.....	59	16	26	24
Run of ore in stope, chute, or bin	.....	.....	.....	.....	3	1	3	.....
Explosives	.....	.....	.....	.....	5	1	5	16
Haulage	1	.....	.....	.....	28	22	34	21
Falls of persons	.....	1	.....	.....	11	9	2	2
Miscellaneous	.....	1	.....	.....	64	93	38	46
Shaft	.....	.....	.....	.....	.....	.....	.....	.....
Total	5	3	0	0	170	142	108	109
Per 1,000 300-day workers	2.98	2.54	.....	.....	101.49	120.03	348.39	86.71

METAL-MINE, COAL-MINE, AND QUARRY ACCIDENTS COMPARED.

Comparative data for accidents at metal mines, coal mines, and quarries of the United States are shown in Tables 24 and 25. The majority of the coal-mining States have long had systematic coal-mine inspection, whereas a number of the metal-mining States either have no inspection service or have started one recently.

TABLE 24.—*Fatality rates in different branches of mineral industries in 1917 compared on a 300-day basis.*

[Length of shift not considered.]

Branch of mineral industry.	Average days active.	Men employed.		Days of labor performed.	Killed.	Number killed per 1,000 employed.	
		Actual number.	Equivalent in 300-day workers (calculated).			On actual-time basis.	On 300-day basis.
Metal mines	287	200,579	192,085	57,625,811	852	4.25	4.44
Metallurgical works:							
Ore-dressing plants	303	24,111	24,372	7,311,499	47	1.95	1.93
Smelters [a]	342	44,376	50,659	15,197,643	53	1.19	1.05
Auxiliary works	328	15,555	17,014	5,104,146	16	1.03	.94
Coal mines	251	757,317	634,666	190,399,680	2,696	3.56	4.25
Coke ovens:							
Beehive	308	18,820	19,295	5,788,576	25	1.33	1.30
By-product	360	13,597	16,300	4,889,853	51	3.75	3.13
Quarries (inside)	249	54,804	45,449	13,634,773	91	1.66	2.00
Quarries (outside)	285	27,486	26,076	7,822,584	40	1.46	1.53
Total, 1917	**266**	**1,156,645**	**1,025,916**	**307,774,565**	**3,871**	**3.35**	**3.77**
Total, 1916	255	1,128,257	957,393	287,218,232	3,224	2.86	3.37

[a] Does not include iron and steel industry.

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TABLE 25.—*METAL MINES, COAL MINES, AND QUARRIES: Principal causes of fatalities, showing percentage due to each cause, 1911 to 1917, by years.*

Industry.	Cause of death.								Total.
	Falls of overburden, roof, quarry material, ore, or coal.	Explosives.	Haulage and handling rock, ore, or coal.	Falls of person.	Electricity.	Machinery.	Gas and dust explosions.	Other causes.	
1911:									
Metal mines	**32.52**	**11.22**	**7.63**	**15.39**	**2.45**	**3.16**	.....	**27.63**	**100.00**
Coal mines	47.40	6.02	17.13	1.28	3.73	1.51	13.74	9.19	**100.00**
Quarries	25.53	26.60	20.21	8.51	1.07	9.04	.....	9.04	**100.00**
1912:									
Metal mines	**34.49**	**14.22**	**10.28**	**13.92**	**3.78**	**3.78**	.....	**19.52**	**100.00**
Coal mines	49.03	6.08	19.14	1.36	3.64	1.65	11.99	7.11	**100.00**
Quarries	17.37	22.06	27.70	8.92	1.87	11.74	.....	10.33	**100.00**
1913:									
Metal mines	**34.70**	**13.03**	**12.88**	**12.30**	**3.81**	**4.39**	.....	**18.89**	**100.00**
Coal mines	45.39	4.95	18.31	1.80	3.16	1.80	18.45	6.14	**100.00**
Quarries	14.75	24.04	23.50	9.29	2.73	12.57	.....	13.12	**100.00**
1914:									
Metal mines	**36.32**	**10.73**	**10.20**	**16.10**	**3.04**	**2.50**	.....	**21.11**	**100.00**
Coal mines	46.09	5.95	18.79	2.85	4.07	1.87	14.22	6.16	**100.00**
Quarries	29.45	19.44	18.33	12.78	1.67	6.11	.....	12.22	**100.00**
1915:									
Metal mines	**36.71**	**14.10**	**10.49**	**15.91**	**2.53**	**1.99**	.....	**18.26**	**100.00**
Coal mines	47.55	6.83	18.64	1.37	4.36	1.68	13.40	6.17	**100.00**
Quarries	30.40	18.92	15.55	11.48	2.03	9.46	.....	12.16	**100.00**
1916:									
Metal mines	**32.28**	**12.77**	**10.04**	**14.64**	**3.73**	**2.58**	.....	**23.96**	**100.00**
Coal mines	47.84	6.56	20.89	1.39	4.36	1.89	10.15	6.92	**100.00**
Quarries	19.08	16.18	19.66	8.09	4.05	16.76	.....	16.18	**100.00**
1917:									
Metal mines	**26.17**	**9.27**	**10.33**	**13.15**	**2.23**	**2.00**	.....	**36.85**	**100.00**
Coal mines	45.18	4.12	22.11	.96	3.52	2.34	13.43	8.34	**100.00**
Quarries	18.32	16.03	24.43	11.45	1.52	15.27	.....	12.98	**100.00**

Because of the great disasters that have happened in coal mines and the prominence given these by the press, coal mining is usually considered much more hazardous than metal mining. The latter, as the figures show, does not claim its death toll in disasters that involve many men, most of the men who die from accidents being killed one at a time.

Percentages of men killed by various causes, also the number employed and the number killed, in metal mines, coal mines, and quarries in the United States are shown in the accompanying tables.

MINING FATALITIES DUE TO EXPLOSIVES.

The accompanying table shows the number of fatilities due to the use of explosives in mining. From 9 to 14 per cent of the metal-mine fatalities and 16 to 26 per cent of the quarry fatalities are due to explosives, while about 6 per cent of the fatalities at coal mines are due to explosives. The percentage of fatalities due to the use of explosives is decreasing.

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Number and percentage of fatalities, due to explosives, at mines and quarries in the United States.

Year.	Metal mines.		Quarries.		Coal mines.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
1911	78	11.22	50	26.60	160	6.02
1912	94	14.22	47	22.06	147	6.08
1913	89	13.03	44	24.04	138	4.95
1914	60	10.73	35	19.44	146	5.95
1915	78	14.10	28	18.92	155	6.83
1916	89	12.77	28	16.18	146	6.56
1917	79	9.27	21	16.03	111	4.12

PRODUCTION AND DISTRIBUTION OF EXPLOSIVES, 1917.[a]

The total production, excluding exports, of explosives in the United States during the calendar year 1917, according to figures that the Bureau of Mines has received from manufacturers, was 582,475,327 pounds (291,238 short tons), as compared with 505,415,052 pounds (252,708 short tons) in 1916.

The production for 1917 is segregated as follows: Black powder, 277,118,525 pounds; "high" explosives other than permissible explosives, 262,316,080 pounds; and permissible explosives 43,040,722 pounds. These figures represent an increase of 61,543,500 pounds of black powder, 7,161,293 pounds of high explosives, and 8,355,482 pounds of permissible explosives, as compared with figures for 1916.

DISTRIBUTION OF EXPLOSIVES BY PRINCIPAL INDUSTRIES.

Table 26 shows the percentage of black powder, high explosives, and permissible explosives used in the various branches of the mining industry. For example, in 1917, 85.1 per cent of the black powder was used in mining coal and only 3.4 per cent for other mining. In 1917 the mining industry of the United States used 76.4 per cent of the explosives produced, as compared with 73.2 per cent in 1916. Of permissible explosives, 76.5 per cent in 1917 were used in coal mining and 14.2 per cent for other mining. Of high explosives only a small percentage is used for mining coal, and approximately 50 per cent is used for other mining.

[a] Fay, A. H. Production of explosives in the United States, 1917: Tech. Paper 192, Bureau of Mines, 1918, 21 pp.

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TABLE 26.—*Percentage of explosives used for various purposes in the United States during 1915, 1916, and 1917.*

	Coal mining.	Other mining.	Railway and other construction work.	All other purposes.	Total.
1917.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Black powder	85.1	3.4	4.7	6.8	100.0
High explosives	10.8	50.4	7.8	31.0	100.0
Permissible explosives	76.5	14.2	.2	9.1	100.0
Total	**51.0**	**25.4**	**5.7**	**17.9**	**100.0**
1916.					
Black powder	82.1	3.6	5.0	9.3	100.0
High explosives	8.2	51.6	8.6	31.6	100.0
Permissible explosives	76.6	17.9	.3	5.2	100.0
Total	**44.4**	**28.8**	**6.5**	**20.3**	**100.0**
1915.					
Black powder	84.8	3.4	3.6	8.2	100.0
High explosives	9.5	46.3	9.4	34.9	100.1
Permissible explosives	79.9	17.1	.5	2.5	100.0
Total	**45.9**	**26.1**	**6.4**	**21.5**	**99.9**

ACCIDENTS AT METALLURGICAL PLANTS DURING 1917.[a]

Table 27 shows the number of men employed, number killed and injured at ore-dressing plants, smelting plants, and auxiliary works, by States, for the calendar year 1917.

TABLE 27.—*Labor and accident statistics of metallurgical works for the year ended Dec. 31, 1917.*

State.	Ore-dressing plants.[b]			Smelting plants.[c]			Auxiliary works.[d]		
	Men employed.	Killed.	Injured.	Men employed.	Killed.	Injured.	Men employed.	Killed.	Injured.
Alabama	193	1	7	.....	.....	.....	69	.....	5
Alaska	467	3	141	.....	.....	.....	232	1	32
Arizona	2,630	6	578	4,398	10	1,184	1,537	2	471
Arkansas	163	.....	11	530	.....	83	114	.....	2
California	755	.....	30	590	5	188	.....	.....	.....
Colorado	1,715	7	214	2,864	1	331	100	.....	18
Georgia	82	.....	1	.....	.....	.....	.....	.....	.....
Idaho	642	.....	62	.....	.....	.....	338	.....	17
Illinois	156	.....	9	3,731	3	749	1,587	1	316
Kansas	206	.....	15	2,148	1	283	19	.....	2
Maryland	26	.....	.....	3,414	2	359	20	.....	2
Michigan	2,426	2	88	1,197	.....	164	.....	.....	.....
Minnesota	337	.....	40	.....	.....	.....	22	.....	.....
Missouri	1,523	2	175	1,560	2	437	493	2	108
Montana	2,051	6	148	2,399	.....	238	2,930	2	237
Nevada	1,565	4	117	1,143	3	132	109	.....	15
New Jersey	537	2	57	4,313	5	677	1,143	.....	135
New Mexico	891	1	183	152	.....	10	911	2	177
New York	565	1	77	.....	.....	.....	185	.....	23
North Carolina	46	.....	14	.....	.....	.....	.....	.....	.....
Oklahoma	452	2	208	5,063	4	895	200	.....	44
Oregon	97	.....	6	.....	.....	.....	20	.....	4
Pennsylvania	24	.....	1	3,700	3	608	1,291	1	148
South Dakota	250	.....	23	.....	.....	.....	.....	.....	.....
Tennessee	425	1	40	.....	.....	.....	488	.....	264
Texas	100	.....	6	1,100	.....	164	.....	.....	.....
Utah	4,103	5	496	2,658	9	556	1,811	4	531
Vermont	215	.....	13	.....	.....	.....	.....	.....	.....
Virginia	709	.....	16	.....	.....	.....	135	.....	41
Washington	63	.....	8	.....	.....	.....	502	.....	82
West Virginia	.....	.....	.....	1,090	1	182	333	.....	44
Wisconsin	247	3	150	113	.....	36	.....	.....	.....
Other States	450	1	18	2,213	4	469	966	1	163
Total	**24,111**	**47**	**2,952**	**44,376**	**53**	**7,745**	**15,555**	**16**	**2,881**
Total 300-day workers	24,755	.....	.....	50,659	.....	.....	17,014	.....	.....
Fatality and injury rates	.....	1.90	119.25	.....	1.05	152.88	.....	.94	169.33

[a] Fay, A. H. Accidents at metallurgical plants, 1917: Tech. Paper 215, Bureau of Mines, 1918, 20 pp.
[b] Stamp mills, sampling works, slime plants, lixiviation, leaching, cyanide and flotation mills.
[c] Blast, reverberatory, and roasting furnaces; converters, casting department, and refineries.
[d] Yards, shops, construction, etc.

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TABLE 28.—*ALL MINES, 1916: Men employed, and number killed, by States, during the year ended Dec. 31, 1916.*

State.	Number of employees.			Number killed.		
	Underground.	On the surface.	Total.	Underground.	On the surface.	Total.
Alabama	4,614	2,746	7,360	23	4	27
Alaska	5,258	2,935	8,193	24	5	29
Arizona	15,534	5,887	21,421	62	6	68
Arkansas	257	755	1,012	.....	1	1
California	7,879	5,416	13,295	36	6	42
Colorado	9,008	1,112	10,120	53	10	63
Connecticut	46	64	110	.....	.....	.....
Florida	.....	1,974	1,974	.....	4	4
Georgia	174	430	604	2	2	4
Idaho	4,469	1,614	6,083	15	.....	15
Illinois	309	200	509	3	1	4
Iowa	250	21	271	1	.....	1
Kansas	394	221	615	3	.....	3
Kentucky	86	192	278	.....	.....	.....
Maine	.....	60	60	.....	.....	.....
Maryland	24	119	143	.....	.....	.....
Massachusetts	23	11	34	.....	.....	.....
Michigan	23,712	10,349	34,061	113	15	128
Minnesota	8,666	10,486	19,152	24	18	42
Missouri	10,596	3,738	14,334	32	3	35
Montana	15,086	4,405	19,491	69	6	75
Nevada	5,222	2,731	7,953	25	5	30
New Hampshire	5	29	34	.....	.....	.....
New Jersey	1,529	502	2,031	6	2	8
New Mexico	2,377	1,805	4,182	10	11	21
New York	2,200	1,462	3,662	14	2	16
North Carolina	396	299	695	.....	.....	.....
Ohio	240	22	262	1	.....	1
Oklahoma	1,107	486	1,593	5	.....	5
Oregon	704	604	1,308	1	.....	1
Pennsylvania	89	371	460	3	1	4
South Carolina	2	151	153	.....	.....	.....
South Dakota	1,650	841	2,491	6	.....	6
Tennessee	1,671	2,165	3,836	7	4	11
Texas	373	570	943	1	1	2
Utah	4,690	2,694	7,384	14	10	24
Vermont	116	39	155	2	.....	2
Virginia	1,044	1,875	2,919	1	2	3
Washington	772	467	1,239	2	1	3
Wisconsin	2,417	1,157	3,574	16	1	17
Wyoming	174	327	501	.....	1	1
Other States	.....	190	190	.....	1	1
Total, 1916	**133,163**	**71,522**	**204,685**	**574**	**123**	**697**

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COMPARATIVE DATA FOR THE YEARS 1911 TO 1917.

Comparative figures by States for labor, accidents, etc., at metal mines for the seven-year period 1911 to 1917, inclusive, are shown in Tables 29 to 36.

TABLE 29.—***ALL MINES:*** *Number of active operators, by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	25	20	24	21	18	22	42
Alaska	(a)	b 30	350	350	367	428	362
Arizona	352	479	426	346	317	445	450
Arkansas	20	11	8	(c)	14	23	38
California	855	1,048	1,054	854	704	840	628
Colorado	660	624	1,013	412	384	738	407
Connecticut	6	5	5	6	5	3	3
Florida	21	24	27	18	13	14	15
Georgia	33	29	21	18	18	26	29
Idaho	513	639	588	526	442	510	414
Illinois	15	8	12	8	5	7	11
Iowa	14	12	9	7	6	9	8
Kansas	45	50	40	24	25	29	28
Kentucky	20	14	15	11	6	8	25
Maine	4	4	5	4	3	4	5
Maryland	20	19	16	12	9	10	12
Massachusetts	7	4	3	3	4	3	3
Michigan	74	79	84	80	80	76	86
Minnesota	40	43	54	57	70	63	66
Missouri	337	318	283	172	151	159	210
Montana	332	405	384	302	283	328	284
Nevada	472	554	566	450	401	406	405
New Hampshire	5	7	7	5	4	3	6
New Jersey	14	10	7	7	8	7	6
New Mexico	134	163	139	118	119	123	135
New York	32	39	36	34	27	37	33
North Carolina	57	70	60	30	23	23	23
Ohio	7	7	7	4	6	5	4
Oklahoma	32	30	36	23	32	37	42
Oregon	210	260	261	225	182	210	183
Pennsylvania	38	38	34	22	19	21	19
South Carolina	5	7	6	5	3	3	3
South Dakota	58	63	74	60	59	65	64
Tennessee	40	36	36	27	25	25	32
Texas	9	8	8	7	6	11	12
Utah	295	336	285	234	188	223	233
Vermont	10	11	10	5	6	7	7
Virginia	49	33	28	25	33	27	36
Washington	238	277	231	188	176	176	168
Wisconsin	78	77	61	38	33	51	53
Wyoming	53	74	71	60	45	49	42
Other States	3	2	3	7	3	4	5
Total	**5,232**	**5,967**	**6,387**	**4,805**	**4,322**	**5,258**	**4,637**

a Not reported. b Placer mines not included. c Not segregated.

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TABLE 30.—***ALL MINES:*** *Actual number of men employed, by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	4,101	4,827	5,212	5,225	4,956	7,360	9,088
Alaska	(a)	b1,914	8,000	8,000	8,125	8,193	7,576
Arizona	12,768	15,591	16,489	14,011	14,057	21,421	22,492
Arkansas	584	404	337	(c)	685	1,012	1,573
California	10,877	10,312	11,476	9,761	10,414	13,295	10,123
Colorado	10,404	8,892	15,949	9,228	6,369	10,120	7,549
Connecticut	164	259	255	216	108	110	115
Florida	4,305	4,461	4,538	2,885	1,737	1,974	2,501
Georgia	1,001	515	444	305	295	604	915
Idaho	4,801	6,229	5,769	5,249	5,190	6,083	6,130
Illinois	848	440	511	490	384	509	677
Iowa	244	200	231	281	214	271	295
Kansas	729	831	608	315	435	615	901
Kentucky	461	460	516	221	174	278	705
Maine	81	72	121	128	105	60	113
Maryland	231	329	359	69	223	143	129
Massachusetts	118	58	48	31	86	34	51
Michigan	31,584	29,469	28,174	27,272	27,512	34,061	32,523
Minnesota	16,548	16,559	19,546	17,694	14,572	19,152	21,820
Missouri	9,901	11,403	9,747	8,480	9,570	14,334	12,006
Montana	13,346	13,340	19,500	13,046	13,846	19,491	16,264
Nevada	6,210	7,547	7,316	6,821	5,713	7,953	6,855
New Hampshire	100	90	83	38	41	34	81
New Jersey	1,739	1,633	1,433	1,362	1,745	2,031	2,192
New Mexico	2,450	2,502	3,766	2,424	2,732	4,182	4,974
New York	3,202	2,710	3,345	3,002	2,558	3,662	3,905
North Carolina	997	1,068	1,167	994	627	605	967
Ohio	362	310	305	192	265	262	221
Oklahoma	418	541	641	596	855	1,593	2,894
Oregon	1,394	1,051	1,349	1,279	1,070	1,308	1,186
Pennsylvania	862	762	656	425	384	460	514
South Carolina	984	1,041	444	416	487	153	233
South Dakota	2,519	1,963	2,091	1,841	1,796	2,491	2,160
Tennessee	4,454	3,480	3,151	3,253	2,821	3,836	3,535
Texas	248	386	350	346	294	943	618
Utah	7,710	8,458	7,872	5,837	5,449	7,384	7,933
Vermont	180	181	143	112	98	155	153
Virginia	3,971	2,516	2,596	1,877	1,976	2,919	2,670
Washington	1,569	1,307	1,302	865	715	1,239	1,098
Wisconsin	2,844	3,834	4,330	2,576	2,651	3,574	3,789
Wyoming	612	662	616	480	386	501	526
Other States	58	591	490	472	398	190	529
Total	**165,979**	**169,199**	**191,276**	**158,115**	**152,118**	**204,685**	**200,579**

a Not reported. b Placer mines not included. c Not segregated.

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TABLE 31.—*ALL MINES: Number of 300-day workers employed, by States, 1911 to 1917.*

[Derived from Table 32.]

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	4,503	4,340	4,951	4,771	4,438	7,208	8,464
Alaska	(a)	b 2,176	6,989	6,842	5,713	5,818	5,567
Arizona	12,288	15,673	17,314	14,537	13,839	21,664	22,464
Arkansas	487	346	290	(c)	544	787	1,359
California	10,206	9,486	10,386	9,091	10,545	12,561	11,390
Colorado	10,501	8,854	15,892	9,228	6,435	10,787	7,560
Connecticut	152	256	247	130	88	94	115
Florida	4,278	4,402	3,834	2,264	1,473	1,662	2,460
Georgia	804	374	340	161	209	394	805
Idaho	4,146	5,641	5,448	4,556	4,623	5,284	5,541
Illinois	780	442	452	348	383	418	608
Iowa	235	163	203	210	157	233	244
Kansas	537	647	490	225	249	524	690
Kentucky	405	286	315	102	140	122	478
Maine	63	54	107	101	66	56	112
Maryland	178	297	347	46	158	70	118
Massachusetts	90	50	47	28	68	28	49
Michigan	31,285	29,822	26,262	24,909	26,474	34,031	32,036
Minnesota	13,919	15,868	19,922	14,665	13,264	16,233	20,706
Missouri	8,361	10,156	8,182	7,268	8,354	13,067	10,107
Montana	13,385	13,263	20,591	11,289	13,679	19,310	16,218
Nevada	6,097	7,422	7,476	6,768	5,753	7,271	6,863
New Hampshire	85	56	55	29	34	31	71
New Jersey	1,592	1,537	1,480	1,347	1,798	2,079	2,065
New Mexico	2,525	2,232	3,047	2,143	2,504	3,938	4,973
New York	3,101	2,633	3,102	2,779	2,301	3,496	4,189
North Carolina	567	717	761	730	495	558	693
Ohio	326	255	286	169	222	232	133
Oklahoma	275	377	494	505	683	1,163	2,102
Oregon	1,107	663	874	695	745	894	817
Pennsylvania	714	638	572	349	318	387	455
South Carolina	983	955	323	257	390	140	168
South Dakota	1,984	1,965	2,401	1,942	1,945	2,616	2,361
Tennessee	3,854	2,938	2,764	2,559	2,363	3,306	3,204
Texas	246	356	342	347	300	1,105	635
Utah	8,262	8,517	8,470	6,231	6,086	7,817	8,620
Vermont	142	151	111	99	92	142	128
Virginia	3,522	2,299	2,369	1,661	1,450	2,512	2,395
Washington	1,051	656	869	394	377	694	745
Wisconsin	2,455	3,465	4,152	2,145	2,476	3,126	3,336
Wyoming	542	520	451	327	296	388	436
Other States	56	714	585	372	470	209	615
Total	**156,089**	**161,662**	**183,593**	**142,619**	**141,997**	**192,455**	**192,085**

a Not reported. b Placer mines not included. c Not segregated.

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TABLE 32.—***ALL MINES:*** *Days of labor performed, by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	1,350,944	1,302,041	1,485,189	1,431,218	1,331,512	2,162,392	2,539,347
Alaska	(a)	b 652,873	2,096,782	2,052,450	1,713,859	1,745,476	1,670,175
Arizona	3,686,479	4,701,702	5,194,231	4,361,024	4,151,671	6,499,137	6,739,067
Arkansas	146,246	103,735	87,046	(c)	163,165	236,074	407,830
California	3,061,843	2,845,815	3,115,698	2,727,281	3,163,407	3,768,322	3,417,161
Colorado	3,150,356	2,656,168	4,767,651	2,768,400	1,930,586	3,236,196	2,264,883
Connecticut	45,644	76,930	74,004	38,975	26,544	28,229	34,456
Florida	1,283,315	1,320,480	1,150,343	679,182	441,908	498,605	737,887
Georgia	241,242	112,081	101,867	48,386	62,758	118,198	241,366
Idaho	1,243,744	1,692,351	1,634,392	1,366,877	1,386,965	1,585,121	1,662,271
Illinois	233,963	132,658	135,732	104,462	114,881	125,479	182,389
Iowa	70,550	48,753	61,042	62,883	47,004	69,959	73,304
Kansas	161,213	194,238	147,034	67,386	74,704	157,194	206,850
Kentucky	121,530	85,873	94,493	30,487	42,175	36,630	143,401
Maine	18,920	16,230	32,178	30,389	19,835	16,948	33,450
Maryland	53,292	89,136	104,195	13,850	47,303	20,909	35,412
Massachusetts	26,994	15,100	14,028	8,463	20,350	8,410	14,803
Michigan	9,385,524	8,946,517	7,878,782	7,472,852	7,942,080	10,209,502	9,610,957
Minnesota	4,175,782	4,760,330	5,976,512	4,399,549	3,979,111	4,870,007	6,211,912
Missouri	2,508,345	3,046,934	2,454,713	2,180,531	2,506,376	3,920,002	3,032,204
Montana	4,015,502	3,979,041	6,177,500	3,386,894	4,103,700	5,793,114	4,865,567
Nevada	1,829,108	2,226,733	2,242,654	2,030,527	1,726,012	2,181,188	2,059,054
New Hampshire	25,524	16,804	16,010	8,574	10,125	9,288	21,205
New Jersey	477,583	460,997	443,973	404,054	539,417	623,793	619,640
New Mexico	757,495	669,707	914,038	643,005	751,056	1,181,330	1,491,783
New York	930,133	789,982	930,515	833,826	690,256	1,048,875	1,256,601
North Carolina	169,983	215,194	228,245	218,973	148,614	167,282	207,936
Ohio	97,720	76,397	85,807	50,604	66,613	69,570	40,040
Oklahoma	82,620	113,041	148,132	151,616	204,973	348,759	630,504
Oregon	332,049	198,906	262,126	208,531	223,416	268,056	245,038
Pennsylvania	214,076	191,254	171,463	104,553	95,549	116,162	136,590
South Carolina	294,900	286,514	96,985	77,088	116,933	41,975	50,400
South Dakota	595,262	589,427	720,169	582,731	583,497	784,715	708,364
Tennessee	1,156,005	881,291	829,277	767,793	708,870	991,838	961,148
Texas	73,870	106,910	102,695	104,000	89,988	331,399	190,495
Utah	2,478,517	2,555,037	2,541,022	1,869,201	1,825,854	2,345,007	2,586,036
Vermont	42,639	45,325	33,236	29,698	27,492	42,557	38,487
Virginia	1,056,461	689,800	710,805	498,414	431,968	753,543	718,380
Washington	315,342	196,807	260,828	118,113	113,009	208,164	223,421
Wisconsin	736,463	1,039,400	1,245,478	643,464	742,653	937,859	1,000,661
Wyoming	162,695	155,903	135,280	98,034	88,849	116,261	130,770
Other States	16,700	214,065	175,705	111,502	140,977	62,900	184,626
Total	**46,826,573**	**48,498,510**	**55,077,855**	**42,785,840**	**42,599,015**	**57,736,425**	**57,625,811**

a Not reported. b Placer mines not included. c Not segregated.

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TABLE 33.—***ALL MINES:*** *Average number of days mines were operated, by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	329	270	285	274	269	294	279
Alaska	(a)	[b] 341	263	257	211	213	220
Arizona	288	302	315	311	295	303	300
Arkansas	250	257	258	[c]	238	233	259
California	282	276	271	279	304	283	338
Colorado	303	299	299	300	303	320	300
Connecticut	272	297	290	180	246	257	300
Florida	298	296	253	235	254	253	295
Georgia	241	218	229	159	213	196	264
Idaho	259	272	283	260	267	261	271
Illinois	276	301	266	213	299	247	269
Iowa	289	244	264	224	220	258	248
Kansas	221	234	242	214	172	256	230
Kentucky	264	187	183	138	242	132	203
Maine	234	225	266	237	189	282	296
Maryland	231	271	290	201	212	146	275
Massachusetts	229	260	292	273	237	247	290
Michigan	297	304	280	274	289	300	296
Minnesota	252	287	306	249	273	254	285
Missouri	253	267	252	257	262	273	253
Montana	301	298	317	260	296	297	299
Nevada	295	295	307	298	302	274	300
New Hampshire	255	187	193	226	247	273	262
New Jersey	275	282	310	297	309	307	283
New Mexico	309	268	243	265	275	282	300
New York	290	292	278	278	270	286	322
North Carolina	170	201	186	220	237	241	215
Ohio	270	246	281	264	251	266	181
Oklahoma	198	209	231	254	240	219	218
Oregon	238	189	194	163	209	205	207
Pennsylvania	248	251	261	246	249	253	266
South Carolina	300	275	318	185	240	274	216
South Dakota	236	300	344	317	325	315	328
Tennessee	260	253	263	236	250	259	272
Texas	298	277	291	301	306	351	308
Utah	321	302	323	320	335	318	326
Vermont	237	250	232	265	281	275	252
Virginia	266	274	274	266	220	258	269
Washington	201	151	200	137	158	168	203
Wisconsin	259	271	288	250	280	262	264
Wyoming	266	236	220	204	230	232	249
Other States	288	362	359	236	354	331	349
Total	**282**	**287**	**288**	**271**	**280**	**282**	**287**

[a] Not reported. [b] Placer mines not included. [c] Not segregated.

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TABLE 34.—*ALL MINES: Fatalities by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	10	33	22	25	12	27	32
Alaska	(a)	b 21	25	19	22	29	30
Arizona	70	67	86	63	41	68	80
Arkansas	2	1	.....	(c)	1	1	.....
California	38	40	52	41	49	42	44
Colorado	43	48	44	47	49	63	47
Connecticut	.....	.....	.....	.....	.....	.....	.....
Florida	9	6	14	10	3	4	7
Georgia	2	.....	1	1	1	4	4
Idaho	23	29	24	25	25	15	24
Illinois	1	1	1	.....	3	4	3
Iowa	1	.....	.....	.....	2	1	.....
Kansas	2	2	4	1	2	3	4
Kentucky	3	1	.....	2	.....	.....	.....
Maine	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....
Massachusetts	.....	.....	.....	.....	.....	.....	.....
Michigan	134	96	82	99	99	128	109
Minnesota	76	50	63	43	36	42	63
Missouri	38	36	34	25	44	35	36
Montana	62	50	64	39	62	75	214
Nevada	50	34	25	22	18	30	31
New Hampshire	.....	1	.....	.....	.....	.....	.....
New Jersey	23	13	8	4	9	8	9
New Mexico	11	13	28	5	4	21	13
New York	10	17	14	11	8	16	13
North Carolina	4	1	4	8	.....	.....	1
Ohio	.....	1	.....	.....	2	1	.....
Oklahoma	.....	2	1	3	4	5	18
Oregon	2	1	3	1	2	1	1
Pennsylvania	1	2	.....	.....	1	4	.....
South Carolina	.....	.....	.....	.....	.....	.....	.....
South Dakota	8	6	8	4	6	6	7
Tennessee	10	12	10	18	8	11	11
Texas	.....	.....	1	.....	1	2	.....
Utah	49	41	36	29	23	24	26
Vermont	.....	2	1	.....	1	2	.....
Virginia	6	4	12	2	1	3	8
Washington	3	4	4	.....	4	3	4
Wisconsin	3	22	11	11	8	17	12
Wyoming	.....	4	.....	.....	2	1	1
Other States	1	.....	1	1	.....	1	.....
Total	**695**	**661**	**683**	**559**	**553**	**697**	**852**

a Not reported. b Placers not included. c Not segregated.

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TABLE 35.—*ALL MINES: Injuries, by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	1,437	2,048	1,896	1,462	1,501	2,013	2,247
Alaska	(a)	b 89	29	260	512	657	543
Arizona	2,650	4,219	5,076	5,374	5,004	7,340	7,860
Arkansas	11	13	11	(c)	29	130	75
California	524	865	842	1,800	2,928	3,751	2,888
Colorado	738	825	254	872	1,219	1,457	1,074
Connecticut	2	.....	4	5	2	2	13
Florida	158	231	261	191	176	164	262
Georgia	22	29	18	20	27	44	66
Idaho	618	720	749	635	971	915	1,044
Illinois	27	39	18	58	51	189	151
Iowa	22	17	46	39	67	53	67
Kansas	78	30	33	19	53	105	81
Kentucky	18	9	14	5	9	38	41
Maine	.....	.....	1	.....	3	4	1
Maryland	10	1	3	4	4	11	2
Massachusetts	.....	1	3	6	11	3	.....
Michigan	7,352	8,064	6,521	6,311	7,821	9,310	8,625
Minnesota	6,190	4,424	6,360	3,427	2,989	3,692	4,473
Missouri	1,240	1,688	1,110	1,355	2,038	3,005	2,384
Montana	1,213	2,222	2,936	2,438	3,486	5,344	3,978
Nevada	373	824	1,093	816	1,014	1,451	1,124
New Hampshire	1	5	2	1	.....	.....	4
New Jersey	418	575	349	394	341	421	377
New Mexico	93	167	295	281	436	717	996
New York	357	400	492	490	477	1,311	1,043
North Carolina	32	63	38	113	135	115	106
Ohio	41	25	31	33	29	34	39
Oklahoma	7	50	129	85	127	301	923
Oregon	19	30	28	43	45	84	123
Pennsylvania	5	8	8	10	8	42	74
South Carolina	1	36	16	13	6	1	8
South Dakota	704	176	491	569	581	739	730
Tennessee	278	390	371	658	614	696	627
Texas	.....	3	14	20	48	262	83
Utah	1,449	1,421	1,855	1,638	1,604	2,262	2,385
Vermont	1	12	8	11	9	30	49
Virginia	127	121	127	132	167	273	262
Washington	20	23	41	21	26	48	280
Wisconsin	336	619	1,236	487	605	1,100	1,031
Wyoming	4	4	7	2	8	39	12
Other States	1	248	155	118	104	84	135
Total	26,577	30,734	32,971	30,216	35,295	48,237	46,286

a Not reported. b Placer mines not included. c Not segregated.

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TABLE 36.—***ALL MINES:*** *Number of fatalities per 1,000 300-day workers, by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	2.22	7.60	4.44	5.24	2.70	3.75	3.78
Alaska	(a)	b 9.65	3.58	2.78	3.85	4.98	5.39
Arizona	5.70	4.27	4.97	4.33	2.96	3.14	3.56
Arkansas	4.11	2.89	.....	(c)	1.84	1.27	.....
California	3.72	4.22	5.01	4.51	4.65	3.34	3.86
Colorado	4.09	5.42	2.77	5.09	7.61	5.84	6.23
Connecticut	.....	.....	.....	.....	.....	.....	.....
Florida	2.10	1.36	3.65	4.42	2.04	2.41	2.85
Georgia	2.49	.....	2.94	6.21	4.78	10.15	4.97
Idaho	5.55	5.14	4.41	5.49	5.41	2.84	4.33
Illinois	1.28	2.26	2.21	.....	7.83	9.57	4.93
Iowa	4.26	.....	.....	.....	12.74	4.29	.....
Kansas	3.72	3.09	8.16	4.44	8.03	5.73	5.80
Kentucky	7.41	3.50	.....	19.61	.....	.....	.....
Maine	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....
Massachusetts	.....	.....	.....	.....	.....	.....	.....
Michigan	4.28	3.22	3.12	3.97	3.74	3.76	3.40
Minnesota	5.46	3.15	3.16	2.93	2.71	2.59	3.04
Missouri	4.54	3.54	4.16	3.44	5.27	2.68	3.56
Montana	4.63	3.77	3.11	3.45	4.53	3.88	13.20
Nevada	8.20	4.58	3.34	3.25	3.13	4.13	4.52
New Hampshire	.....	17.86	.....	.....	.....	.....	.....
New Jersey	14.45	8.46	5.41	2.97	5.01	3.85	4.36
New Mexico	4.36	5.82	9.19	2.33	1.60	5.33	2.61
New York	3.22	6.46	4.51	3.96	3.48	4.58	3.10
North Carolina	7.05	1.39	5.26	10.96	.....	.....	1.44
Ohio	.....	3.92	.....	.....	9.01	4.31	.....
Oklahoma	.....	5.31	2.02	5.94	5.86	4.30	8.56
Oregon	1.81	1.51	3.43	1.44	2.68	1.12	1.22
Pennsylvania	1.41	3.13	.....	.....	3.14	10.34	.....
South Carolina	.....	.....	.....	.....	.....	.....	.....
South Dakota	4.03	3.05	3.33	2.06	3.08	2.29	2.96
Tennessee	2.59	4.08	3.62	7.03	3.39	3.33	3.43
Texas	.....	.....	2.92	.....	3.33	1.81	.....
Utah	5.93	4.81	4.25	4.65	3.78	3.07	3.02
Vermont	.....	13.25	9.01	.....	10.87	14.08	.....
Virginia	1.70	1.74	5.07	1.20	.69	1.19	3.34
Washington	2.85	6.10	4.60	.....	10.61	4.32	5.37
Wisconsin	1.22	6.35	2.65	5.13	3.23	5.44	3.60
Wyoming	.....	7.69	.....	.....	6.76	2.58	2.29
Other States	17.86	.....	1.71	2.69	.....	4.78	.....
Total	**4.45**	**4.09**	**3.72**	**3.92**	**3.89**	**3.62**	**4.44**

a Not reported. b Placer mines not included. c Not segregated.

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TABLE 37.—*ALL MINES: Injuries per 1,000 300-day workers employed, by States, 1911 to 1917.*

State.	1911	1912	1913	1914	1915	1916	1917
Alabama	319.12	471.89	382.95	306.43	338.22	279.27	265.48
Alaska	(a)	b 40.90	4.15	38.00	89.62	112.93	97.54
Arizona	215.66	269.19	293.17	369.68	361.59	338.81	349.89
Arkansas	22.59	37.57	37.93	(c)	53.31	165.18	55.19
California	51.34	91.19	81.07	198.00	277.69	298.62	253.56
Colorado	70.28	93.18	15.98	94.50	189.43	135.07	142.25
Connecticut	13.16	.....	16.19	38.46	22.73	21.28	113.04
Florida	36.93	52.48	68.08	84.36	119.48	98.68	106.50
Georgia	27.36	77.54	52.94	124.22	129.19	111.68	81.99
Idaho	149.06	127.64	137.48	139.38	210.04	173.16	188.41
Illinois	34.62	88.24	37.82	166.67	133.16	452.15	248.36
Iowa	93.62	104.29	226.60	185.71	426.75	227.47	274.59
Kansas	145.25	46.37	67.35	84.44	212.85	200.38	117.39
Kentucky	44.44	31.47	44.44	49.02	63.83	311.48	85.77
Maine	.....	.....	9.35	.....	45.45	71.43	8.93
Maryland	56.18	3.37	8.65	86.96	25.32	157.14	16.95
Massachusetts	.....	20.00	63.83	214.29	161.76	107.14	.....
Michigan	235.00	270.40	248.30	253.36	295.43	273.57	269.23
Minnesota	444.72	278.80	319.25	233.69	225.35	227.44	216.02
Missouri	148.31	166.21	135.66	186.43	243.93	229.97	235.88
Montana	90.62	167.53	142.59	215.96	254.84	276.75	245.28
Nevada	61.18	111.02	146.20	120.57	176.26	199.56	163.78
New Hampshire	11.76	89.29	36.36	34.48	.....	.....	56.34
New Jersey	262.56	374.11	235.81	292.50	189.66	202.50	182.57
New Mexico	36.83	74.82	96.82	131.13	174.12	182.07	200.28
New York	115.12	151.92	158.61	176.32	207.30	375.00	248.99
North Carolina	56.44	87.87	49.93	154.79	272.73	206.09	152.96
Ohio	125.77	98.04	108.39	195.27	130.63	146.55	293.23
Oklahoma	25.45	132.63	261.13	168.32	185.94	258.81	439.11
Oregon	17.16	45.25	32.04	61.87	60.40	93.96	150.55
Pennsylvania	7.00	12.54	13.99	28.65	25.16	108.53	162.64
South Carolina	1.02	37.70	49.54	50.58	15.38	71.43	47.62
South Dakota	354.84	89.57	204.50	293.00	298.71	282.49	309.19
Tennessee	72.13	132.74	134.23	257.13	259.84	210.53	195.69
Texas	.....	8.43	40.94	57.64	160.00	237.10	130.71
Utah	176.38	166.84	219.01	262.88	263.56	289.37	276.68
Vermont	7.04	79.47	72.07	111.11	97.83	211.27	382.81
Virginia	36.06	52.63	53.61	79.47	115.17	108.68	109.39
Washington	19.03	35.06	47.18	53.30	68.97	69.16	375.84
Wisconsin	136.86	178.64	297.69	227.04	244.35	351.89	309.05
Wyoming	7.38	7.69	15.52	6.12	27.03	100.52	27.52
Other States	17.86	347.34	264.96	317.20	221.28	401.91	219.51
Total	170.27	190.11	179.59	211.87	248.56	250.64	240.97

a Not reported. b Placer mines not included. c Not segregated.

FORM FOR MINE-ACCIDENT RECORDS.

In order that more detailed information may be had, the bureau prepared forms in 1915 for recording accidents at mines (Form 6–4791) and metallurgical works (Form 6–841), in the hope that many of the mining companies would consider their adoption. These forms were prepared with two objects in view: First, that more detailed information on different kinds of accidents may be obtained; and, second, that the adoption of the forms will help to standardize the records.

Copies of these forms will be supplied by the bureau with the understanding that a summary report will be made for the bureau's use at the close of the year.

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PUBLICATIONS AVAILABLE FOR FREE DISTRIBUTION.

BULLETIN 115. Coal-mine fatalities in the United States, 1870–1914, with statistics of coal production, labor, and mining methods, by States and calendar years, compiled by A. H. Fay. 1916. 570 pp., 3 pls., 13 figs.

BULLETIN 140. Occupational hazards at blast-furnace plants and accident prevention, based on records of accidents at blast furnaces in Pennsylvania in 1915, by F. H. Willcox. 1917. 155 pp., 16 pls.

TECHNICAL PAPER 46. Quarry accidents in the United States during the calendar year 1911, compiled by A. H. Fay. 1913. 32 pp.

TECHNICAL PAPER 61. Metal-mine accidents in the United States during the calendar year 1912, compiled by A. H. Fay. 1913. 76 pp., 1 fig.

TECHNICAL PAPER 92. Quarry accidents in the United States during the calendar year 1913, compiled by A. H. Fay. 1914. 76 pp.

TECHNICAL PAPER 118. Coke-oven accidents in the United States during the calendar years 1913 and 1914, compiled by A. H. Fay. 1915. 16 pp.

TECHNICAL PAPER 124. Accidents at metallurgical works in the United States during the calendar years 1913 and 1914, compiled by A. H. Fay. 1915. 28 pp.

TECHNICAL PAPER 128. Quarry accidents in the United States during the calendar year 1914, compiled by A. H. Fay. 1915. 45 pp.

TECHNICAL PAPER 129. Metal-mine accidents in the United States during the calendar year 1914, compiled by A. H. Fay. 1915. 96 pp., 1 pl., 3 figs.

TECHNICAL PAPER 151. Coke-oven accidents in the United States during the calendar year 1915, compiled by A. H. Fay. 1916. 18 pp.

TECHNICAL PAPER 164. Accidents at metallurgical works in the United States during the calendar year 1915, compiled by A. H. Fay. 1916. 20 pp.

TECHNICAL PAPER 165. Quarry accidents in the United States during the calendar year 1915, compiled by A. H. Fay. 1917. 77 pp., 1 pl.

TECHNICAL PAPER 168. Metal-mine accidents in the United States during the calendar year 1915, compiled by A. H. Fay. 1917. 114 pp., 2 figs.

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TECHNICAL PAPER 201. Accidents at metallurgical works in the United States during the calendar year 1916, compiled by A. H. Fay. 1918. 18 pp.

TECHNICAL PAPER 202. Metal-mine accidents in the United States during the calendar year 1916, compiled by A. H. Fay. 1918. 91 pp.

TECHNICAL PAPER 206. Coke-oven accidents in the United States during the calendar year 1917, compiled by A. H. Fay. 1918. 19 pp.

TECHNICAL PAPER 213. Quarry accidents in the United States during the calendar year 1917, compiled by A. H. Fay. 1919. 62 pp.

TECHNICAL PAPER 215. Accidents at metallurgical works in the United States during the calendar year 1917, compiled by A. H. Fay. 1919. 23 pp.

Coal-mine fatalities in the United States, 1916, compiled by A. H. Fay. 1917. 42 pp.

Coal-mine fatalities in the United States, 1917, compiled by A. H. Fay. 1918. 37 pp.

Coal-mine fatalities in the United States, 1918, compiled by A. H. Fay. 1919. 61 pp.

PUBLICATIONS THAT MAY BE OBTAINED ONLY THROUGH THE SUPERINTENDENT OF DOCUMENTS.

BULLETIN 69. Coal-mine accidents in the United States and foreign countries, compiled by F. W. Horton. 1913. 102 pp., 3 pls., 40 figs. 25 cents.

TECHNICAL PAPER 27. Monthly statement of coal-mine accidents in the United States, January to August, 1912, and statistics for 1910 and 1911, compiled by F. W. Horton. 1912. 24 pp. 5 cents.

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TECHNICAL PAPER 48. Coal-mine accidents in the United States, 1896–1912, with monthly statistics for 1912, by F. W. Horton. 1913. 74 pp., 10 figs. 10 cents.

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